Mapes Crocker Project

Biological Evaluation

Plumas National Forest
Beckwourth Ranger District

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Introduction

The United States Department of Agriculture Forest Service (FS) is proposing the Mapes Crocker project to improve forest health and resilience, wildlife habitat, and water quality on approximately 10,500 acres of National Forest System (NFS) lands managed by the Plumas National Forest on the Beckwourth Ranger District in Plumas County, CA. The proposed project area extends north from Portola, along the east side of Lake Davis (Figure 1).

The purpose of this Biological Evaluation (BE) is to review and document how the proposed Mapes Crocker Project may affect Region 5 Forest Service Sensitive species and their habitats, and is prepared in accordance with standards established in Forest Service Manual direction (FSM 2672.4).

Species federally listed under the Endangered Species Act are considered in a separate document, the Biological Assessment for the Mapes Project, which encompasses the smaller Mapes Crocker project and provides sufficient and relevant assessment of project effects. An Official Species List of Federally Threatened and Endangered Species that may be affected by the larger Mapes Project was provided by the US Fish and Wildlife Service on September 15, 2020, and an updated list for the Mapes Crocker Project specifically was provided on January 11, 2022 (accessed via https://ecos.fws.gov/ipac/). Table 1 contains a list of Threatened, Endangered, Proposed, Candidate and Sensitive (TES) species that potentially occur on the PNF.

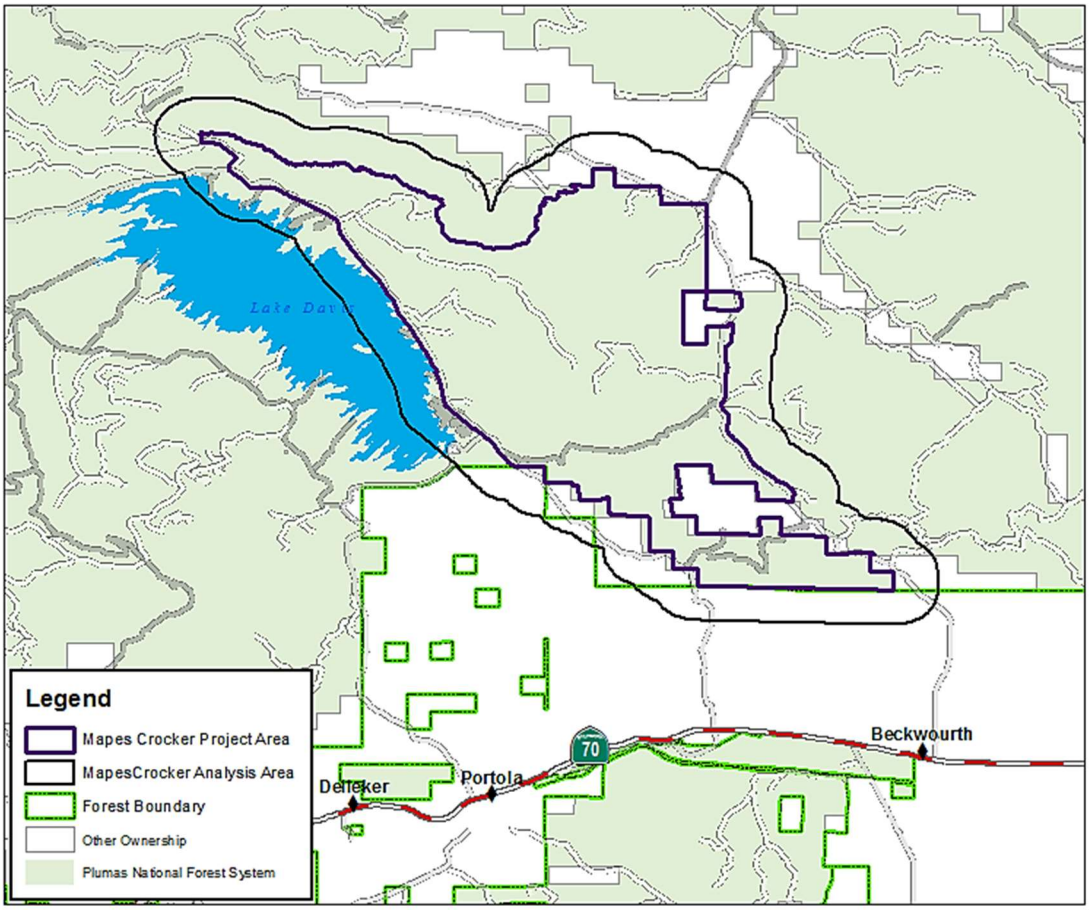

Figure 1. Mapes Crocker Project Area Overview

Table 1. Region 5 Forest Service sensitive animal species that potentially occur on Plumas National Forest

Threatened, Endangered and Sensitive Species (Scientific Name)	Species Status*	Habitat or Ecosystem Component	Category Project Analysis**
Invertebrates			
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT	Elderberry trees (*Sambucus* spp.)	1
Western bumble bee (*Bombus occidentalis*)	USFS : S	Access to Flowering Plants and Abandoned Rodent Burrows	3
Fish			
Hardhead minnow (*Mylopharodon conocephalus*)	USFS : S, DFW : SSC	Riverine and Lacustrine	1
Delta smelt (*Hypomesus transpacificus*)	FT	Riverine and Lacustrine	1
Amphibians			
Foothill yellow-legged frog (*Rana boylii*)	FP SE	Riverine and Lacustrine	3
California red-legged frog (*Rana aurora draytonii*)	FT	Riverine and Lacustrine	1
Sierra Nevada yellow-legged frog (*Rana sierrae*)	FE	Riverine and Lacustrine	3
Reptiles			
Western pond turtle (*Actinemys marmorata*)	USFS : S, DFW : SSC	Riverine and Lacustrine	1
Birds			
Bald eagle (*Haliaeetus leucocephalus*)	USFS : S, SE, USFWS : BCC	Large trees adjacent to riverine and lacustrine	3
California spotted owl (*Strix occidentalis occidentalis*)	USFS : S,MIS, DFW : SSC, USFWS : BCC	Late Seral Closed Canopy Coniferous Forest	3
Greater sandhill crane (*Grus canadensis tabida*)	USFS : S, ST	Open habitats (grasslands and croplands), shallow lakes, fresh emergent wetlands	3
Great gray owl (*Strix nebulosa*)	USFS : S, SE	Late Seral Closed Canopy Coniferous Forest adjacent to wet meadows	2
Northern goshawk (*Accipiter gentilis*)	USFS : S, DFW : SSC	Late Seral Closed Canopy Coniferous Forest	3
Willow flycatcher (*Empidonax trailii brewsteri*)	USFS : S,SE, USFWS : BCC	Riparian with Dense Willows	3
Yellow-billed Cuckoo (*Coccyzus americanus*)	FT	Large patches of riparian vegetation along low gradient open river valleys	1
Mammals			
Sierra marten (*Martes caurina sierrae*)	USFS : S	Late Seral Closed Canopy Coniferous Forest	2
California wolverine (*Gulo gulo luteus*)	USFS : S, DFW: FP; ST	Late Seral Closed Canopy Coniferous Forest	2
Gray wolf (*Canis lupus*)	USFS : S,	Generalist: Forest, Grassland, Tundra, Desert	2
Pacific fisher (*Pekania pennanti*)	USFS : S, DFW : SSC	Late Seral Closed Canopy Coniferous Forest	2
Pallid bat (*Antrozous pallidus*)	USFS : S, DFW : SSC	Open, Dry Habitats with Rocky Area	3
Townsend's big-eared bat (*Corynorhinus townsendii*)	USFS : S, DFW : SSC	Mesic Habitats	3
Fringed myotis (*Myotis thysanodes*)	USFS : S	Hardwood-conifer Open Canopy Forest	3

***Species Status: FE = Federal Endangered, FT = Federal Threatened, FP = Federal Proposed, FC = Federal Candidate, USFS : S** = U.S. Forest Service - Sensitive, **USFS : MIS** = U.S. Forest Service – Management Indicator Species, **SE** = State Endangered, **ST** = State Threatened, **DFW: FP** = State Fully Protected, **DFW : SSC** = State Species of Special Concern, **USFWS : BCC** = U. S. Fish and Wildlife Service Birds of Conservation Concern, **SOI** = Species of Interest.

** **Category 1:** Species whose habitat is not in or adjacent to the aquatic or terrestrial wildlife analysis areas and would not be affected by the project. **Category 2:** Species whose habitat is in or adjacent to the aquatic or terrestrial wildlife analysis areas, but would not be either directly or indirectly affected by the project. **Category 3:** Species whose habitat would be either directly or indirectly affected by the project.

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), Delta smelt (*Hypomesus transpacificus*) hardhead minnow (*Mylopharodon conocephalus*), California red-legged frog (*Rana aurora draytonii),* western pond turtle (*Actinemys marmorata*), and Yellow-billed Cuckoo (*Coccyzus americanus*), identified as Category 1 above, will not be further discussed because the project area is either outside the range or suitable habitat does not exist in the project area for these species. Therefore, the project will not directly or indirectly affect these species or their habitat.

Category 2 species, with habitat in or adjacent to the analysis area that would not be either directly or indirectly affected by the project include great gray owl (*Strix nebulosa*), Sierra marten (*Martes caurina sierrae*), California wolverine (*Gulo gulo luteus*), gray wolf (*Canis lupus*), and Pacific fisher (*Pekania pennanti*). Although apparently suitable habitat for great gray owls occurs on the Forest, they are sporadic visitors at best and not known from the adjacent landscape. Great gray owl sightings have been reported on the Forest; however, there are no records of breeding from any time, and there have been no confirmed observations in the last 10 years, despite survey efforts. There are no records of great gray owl observations in the analysis area. Proposed treatments are not expected to affect the suitability of habitat for wolverine or gray wolf, as they are somewhat generalists and use a variety of conditions. Sierra marten and Pacific fisher have not been found to occur in the analysis area, despite survey effort. Category 2 species will not be further addressed in this BE.

Species with habitat that would be either directly or indirectly affected by the Mapes Crocker Project (Category 3, Table 1) are carried forward in the BE. The BE report will evaluate the direct, indirect, and cumulative effects of the proposed action on these species and their habitats.

Analysis Framework: Relevant Laws, Regulation, and Policy

The Forest Service must adhere to the following laws, regulations, and policies when planning and implementing projects affecting Forest Service Lands:

Federal Law

- Bald and Golden Eagle Act of 1940, as amended
- Endangered Species Act (ESA 1973)
- National Environmental Policy Act (NEPA 1969)
- National Forest Management Act (NFMA 1976)
- The Migratory Bird Treaty Act of 1918, as amended

Executive Orders

- Invasive Species, EO 13112 of February 3, 1999
- Migratory Birds, EO 12962 of January 10, 2001
- Environmental Justice, EO 12898 of February 11, 1994

Regulation

- Code of Federal Regulations (23, 36, 50 CFR)

- Departmental Regulation 9500-4
- Plumas National Forest Land and Resource Management Plan (PNF LRMP), 1988
- Sierra Nevada Forest Plan Amendment (SNFPA) and its Final Supplemental Environmental Impact Statement (FSEIS), Record of Decision (ROD), January 2001
- Sierra Nevada Forest Plan Amendment (SNFPA) and its Final Supplemental Environmental Impact Statement (FSEIS), Record of Decision (ROD), January 2004

Policy

- Forest Service Manual and Handbooks (FSM/H 1200, 1500, 1700, 2600)
- Regional Forester (Region 5) Sensitive Plant and Animal Species List (June 10, 1998), as appended October 15, 2007; updated July 3, 2013.
- USDA Forest Service Best Management Practices (USDA 2012)
- USFWS Species List (September 15, 2020)

Forest Service Manual policy for Forest Service Sensitive Species (2670.32) states that the USFS shall, among other things:

- *Review programs and activities as part of the National Environmental Policy Act of 1969 process through a biological evaluation, to determine their potential effect on sensitive species.*
- *Avoid or minimize impacts to species whose viability has been identified as a concern.*
- *Analyze, if impacts cannot be avoided, the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. (The line officer, with project approval authority, makes the decision to allow or disallow impact, but the decision must not result in loss of species viability or create significant trends toward federal listing.)*

The proposed activities and objectives are consistent with Federal laws and regulations in a manner that maintains or improves project area resource conditions and achieves the objectives and desired conditions described in the Plumas National Forest Land and Resource Management Plan (PNF LRMP; USDA 1988), as amended by the Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement (SNFPA FSEIS) and Record of Decision (ROD) (USDA 2004).

Forest Service direction for Threatened, Endangered, and Sensitive (TES) species incorporated in the BE can be found in the Forest Service Manual (FSM 2672.4). The Plumas National Forest Land and Resource Management Plan (LRMP), as amended by SNFPA FSEIS ROD provides standards and guidelines for how TES species will be managed. Appendix A of this Biological Evaluation provides a list of standards and guidelines that are a subset of all applicable Land and Resource Management Plan direction, and this project is being analyzed for consistency to all applicable Forest Plan standards and guidelines for terrestrial and aquatic wildlife, including Aquatic Management Strategy (AMS) Goals and Riparian Conservation Objectives (RCOs, USDA 2004).

Information regarding threatened, endangered, proposed, candidate and sensitive animals is also obtained through the cooperation of the US Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW).

State and Local Law

- California Endangered Species Act (CESA 1970)
    - Plumas National Forest Land and Resource Management Plan (USDA 1988, pages 4-33): *Maintain viability of State-listed species. In cooperation with the DFG, conduct surveys for State-listed species. At a minimum, provide habitat sufficient to maintain existing populations.*

California Department of Fish and Wildlife

Input specific to the Mapes Crocker Project was not solicited from the California Department of Fish and Wildlife through the public scoping process. However, all past advice from the Department was considered during the planning of the Mapes Crocker Project.

Analysis Methodology

Geographic Analysis Areas

The **project area** (10,564 acres) is defined as the area used for planning, in which all project-related activities will occur, and is located at elevations ranging from approximately 5,000-7,500 feet. The **treatment area** (4,331 acres) is defined as the units to be treated within the project area boundary. For the purpose of this Biological Evaluation, the **wildlife analysis area** (20,141 acres; Figure 1) is the same for both terrestrial and aquatic wildlife, and is defined as the project area plus an additional larger land base that allows habitat changes predicted as a result of project activities to be viewed on a broader, more realistic scale of other available habitat, while not being so large as to mask the effects of project activities. The wildlife analysis area was delineated as a 0.5 mile buffer on the project area and includes 15,921 acres of National Forest System lands; only NFS lands will be considered in this evaluation.

Specific Methodology

It is assumed in this analysis that the Proposed Action would be implemented as stated, in compliance with all rules and regulations governing land management activities, including the use of the appropriate Limited Operating Periods (LOPs) identified in Table 10.

The Mapes Crocker Project was reviewed on the ground, as well as using satellite imagery (NAIP), vegetation layer spatial datasets, species specific spatial datasets and known information to help determine suitable habitat for species. The California Wildlife Habitat Relationships (CWHR, CDFW 2010) vegetation classification system was used as the baseline acres for analyses (Appendix C of USDA 2004). Forest-wide vegetation typing is updated after fires and forest activities to most accurately represent available habitat types. For the analysis of effects, changes to suitable habitat and impacts to management units (i.e., protected activity centers, PACs; nesting territories, etc.) were determined using a spatial dataset of the vegetation layer combined with type of treatments (e.g. mechanical thinning, hand thinning, prescribed fire). In the field, areas identified as suitable habitat in the analysis area were surveyed according to applicable Region 5 approved protocols:

- “Standardized Protocol for Surveying Aquatic Amphibians” (Fellers and Freel 1995)
- “Protocol for Surveying for Spotted Owls in Proposed Management Activity Areas and Habitat Conservation Areas March 12, 1991 (Revised February 1993)” (USDA 1993)
- “Survey Methodology for Northern Goshawks in the Pacific Southwest Region, U.S. Forest Service” (USDA 2000)

- "American Marten, Fisher, Lynx and Wolverine: Survey Methods for Their Detection" (Zielinski and Kucera 1995)

Data Sources

- GIS layers of the following information on Plumas and Tahoe National Forests: vegetation layer, ownership, aquatic features (streams, springs and lakes, etc.), and species management layers (e.g. PACs, HRCAs), species observations.
- US Forest Service Region 5 GIS NHD stream layer
- Survey reports, incidental detections, field verification of potential suitable habitat
- Scientific literature

Terrestrial and Aquatic Wildlife Indicators

Acres of suitable habitat modified, lost or fragmented at various scales.
Habitat components modified, lost or fragmented.
Changes in vegetation and meadow characteristics.
Changes in road density.

Timeframe

Short-term timeframe: 1 year
Long-term timeframe: 25-30 years, because climate change, unforeseeable future projects, demographic changes, etc. makes assumptions beyond this timeframe speculative.

Cumulative Effects Analysis

Long-term timeframe: 25-30 years because climate change, unforeseeable future projects, demographic changes, etc. make assumptions beyond this timeframe speculative.
Spatial Boundary: Wildlife Analysis Area
Methodology: In order to understand the contribution of past actions to the cumulative effects of the proposed action, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond) and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action. In fact, focusing on individual actions could be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of

which particular action or event contributed those effects. Third, public scoping for this project did not identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.”

Present and future projects planned that overlap with the Wildlife Analysis Area may have cumulative impacts to wildlife, fisheries and amphibians. In this analysis, each present and future project is analyzed by species in order to understand the contribution of present and future projects to the cumulative effects of the proposed action. See Appendix C for a list of ongoing and reasonably foreseeable activities that were considered in each of the environment and species analyses.

The current conditions of Plumas National Forest include approximately 830,000 acres (58% of Plumas National Forest lands) which burned at mixed, although predominately high, severity during wildfires between 2019-2021. This recent change in landscape conditions may contribute to cumulative impacts to wildlife not apparent at the scale of the analysis area for this project.

Existing Conditions

Terrestrial Environment

The Mapes Crocker Wildlife Analysis Area is dominated by eastside pine type habitat, comprised of ponderosa pine (*Pinus ponderosa*) and Jeffery pine (*Pinus jefferyi*) with a smaller element of white fir (*Abies concolor),* incense-cedar (*Calocedrus decurrens*) and western juniper (*Juniperus occidentalis*). Prior to European settlement, the eastside pine habitat type would have been characterized by open stands with low canopy cover and clumps of large shade-intolerant trees. Regular, low-intensity fire kept stand densities and regeneration success low. Sierra mixed conifer type habitat occurs at a lower frequency in the Mapes Crocker project area, typically in moister areas capable of retaining snow loads and moisture for longer periods of time. Under a natural low-severity, high-frequency fire regime, the typically more xeric, southwest-facing and ridgetop sites would have been dominated by larger diameter pine species in open canopy conditions; northeast-facing aspects and riparian areas in canyon/drainage bottoms, being more mesic and less prone to fire, would have contained higher densities of trees with a larger component of shade-tolerant tree species (North et al. 2009). Fire exclusion and past timber harvests have contributed to a change in the forest habitat, resulting in increased stand densities than would not have existed naturally, and an increased component of shade-intolerant species such as white fir and incense cedar.

Stands in the project area are overstocked and trees are competing for sunlight, water, and soil nutrients resulting in poor growth and susceptibility to high-severity wildfire, disease and pests. Overstocked stands are slowing the progression to late seral stage. Late seral stage habitat is scarce and distributed in small pockets. There is also a lack of large snags and large dead and down wood (>15 inches diameter).

Historically, fire kept conifer encroachment of meadows, springs, and aspens stands in check. Without this natural process, conifers have been able to become established within these features. Meadow systems, springs, and aspen stands in the project area are declining as juniper and other conifer trees encroach. Conifers limit the availability of nutrients, water, and sunlight and easily outcompete shade-intolerant aspen and meadow vegetation. The loss of meadow vegetation and its dense, shallow roots results in decreased streambank soil stability and a reduction of wildlife habitat quality. Wetland and riparian areas are local and regional centers of biodiversity, providing important habitat for many species of plants and animals.

Approximately 62% (9,817 acres) of the analysis area is considered forested habitat, with the non-forested habitat comprised of sagebrush, shrubs, and grasslands. The majority of the forested stands in the Mapes Crocker analysis area are dominated by trees in the 12 to 24-inch diameter at breast height (DBH) range (CWHR 4), accounting for approximately 45% of the Wildlife Analysis Area (Table 2) and 73% of the forested area therein. CWHR size class 5 habitat accounts for approximately 10% of the Wildlife Analysis Area and 16% of forested habitat. No CWHR size class 6 exists within the Wildlife Analysis Area. Appendix B defines the CWHR vegetation types and classes. Only habitat data for National Forest System land is used in this analysis of habitat presence since the Forest Service does not have authority over non-Forest Service Land. It is acknowledged that there are some disparities in habitat typing between CWHR and actual stand data and that the acres could be inexact estimates of habitat availability. In 2021, approximately 9% of the Mapes Crocker Project analysis area (1,379 acres) burned in the Dixie Fire at mixed but primarily high severity. For the purpose of this analysis, stands burned at greater that 50% basal area mortality were not counted as acres of moderate or dense canopy habitat.

Road densities within the analysis area are moderate (see the Mapes Crocker Project Hydrology and Soils Report for a detailed description).

Table 2. Summary of California Wildlife Habitat Relationships (CWHR) types within the wildlife analysis area (all acres are approximate and only include National Forest System lands).

Seral Stage	CWHR Size-Density	Acres of existing condition in analysis area	Acres of existing condition in units
Conifer Forest - Multi-Layered, Dense Canopy	6	0	0
Conifer Forest - Late Seral Dense Canopy	5D	397	225
Conifer Forest - Late Seral Moderate Canopy	5M	1,083	514
Conifer Forest - Late Seral Open Canopy	5P	102	27
Conifer Forest - Late Seral Sparse Canopy	5S	0	0
Conifer Forest - Mid Seral Dense Canopy	4D	848	468
Conifer Forest - Mid Seral Moderate Canopy	4M	3,548	1,536
Conifer Forest - Mid Seral Open Canopy	4P	2,454	891
Conifer Forest - Mid Seral Sparse Canopy	4S	339	45
Conifer Forest - Early Seral Dense Canopy	3D	295	116
Conifer Forest - Early Seral Moderate Canopy	3M	242	82
Conifer Forest - Early Seral	Size Class 1,2 3P, 3S	476	159
Hardwood Forest		33	6
Shrub Dominated		2,918	218
Grassland		919	44
Non-Vegetated		889	0
Burned at >50% Basal Area		1,379	0
Total*		**15,921**	**4,331**

Conifer forest includes EPN, RFR, SMC and WFR; Hardwood Forest includes ASP, MHC and MHW; Shrub Dominated includes MCP, MRI, and SGB; Grassland includes AGS and WTM; Non-Vegetated includes BAR and LAC.

Size Class: 1 = Seedling Tree <1" DBH; 2 = Sapling Tree 1 - 6" DBH; 3 = Pole Tree 6 - 11" DBH, 4 = Small Tree 11 - 24"DBH; 5 = Medium/Large Tree >24"DBH; 6 = Multi-layered Tree.

Canopy Cover: D = Dense Canopy Cover (> 60%); M = Moderate Canopy Cover (40 - 59%); P = Open Canopy Cover (25 – 39%); S = Sparse Canopy Cover (10 – 24%).

Vegetation Types: AGS = Annual Grassland; ASP = Aspen; BAR = Barren; EPN = Eastside Pine; LAC = Lacustrine; MCP = Montane Chaparral; MHC = Montane Hardwood-Conifer; MHW = Montane Hardwood; MRI = Montane Riparian; RFR = Red Fir; SGB = Sagebrush; SMC = Sierra Mixed Conifer; WFR = White Fir; WTM = Wet Meadow (Mayer and Laudenslayer 1988).

*Displayed figures may not add up to the total due to rounding.

Aquatic Environment

The Mapes Crocker Wildlife Analysis Area contains portions of four Hydrologic Unit Code (HUC) 12 Level 6 subwatersheds, with approximately 4 miles of perennial, 26 miles of intermittent, and 7 miles of ephemeral streams for a total 37 miles of streams. The analysis area is primarily located in the Red Clover Creek and Upper Middle Fork Feather River watersheds (HUC 10 Level 5) with a small portion in the Sierra Valley watershed. For a more in-depth analysis of watershed, stream, and soil conditions, see the Mapes Crocker Project Hydrology and Soils Report.

Description of the Proposed Action

The Beckwourth District of the Plumas National Forest proposes vegetation management activities to meet fuels and timber stand improvement objectives, improve wildlife habitat by reducing conifer encroachment in aspen stands, meadow habitat, and around special aquatic features, and improve watershed condition by reducing transportation system impacts.

The treatment area is approximately 4,331 acres, comprised of: 3,934 acres of mechanical vegetation treatments and 397 acres of hand thinning treatments all with follow-up under-burning, 5 miles of planned road obliteration, and additional system road improvements. The project is expected to be implemented 2022-2032, depending on burn conditions.

The Proposed Action consists of the following actions on identified National Forest System (NFS) lands:

- Mechanical thinning (Variable Density Thin) of trees up to 29.9 inches DBH for fuels reduction and timber stand improvement.
- Mechanical fuels treatments (mastication, grapple piling) as primary and secondary treatments.
- Thinning for wildlife habitat improvement (combination of hand thinning and mechanical thinning within aspen stands, meadows, and around springs).
- Prescribed fire as a secondary treatment for fuels reduction, wildlife habitat improvement, and to reintroduce fire as an ecosystem process.
- System road improvements and non-system road decommissioning to reduce transportation system effects on watershed resources.

Table 3. Summary of the Number of Acres of each Silvicultural Treatment Occurring in the Mapes Crocker Project Area

Action	Acres
Mechanical thinning with follow-up prescribed fire	3,336
Mechanical fuels reduction with follow-up prescribed fire	598
Hand thinning with follow-up prescribed fire	397

Action	Acres
Grand Total	**4,331**

Note: Acres may vary slightly during the final layout due to topography, stand condition, etc. Acres may not add up to total due to rounding.

Vegetation Treatments

Mechanical Thinning (3,336 acres)

Mechanical thinning and post treatment underburning is planned on approximately 3,336 acres. Thinning will target general forest timber stands that are overstocked, have poor regeneration, have high fuel loading, and/or are displaying signs of disease, as well as aspen stands and meadow edges that are being encroached by conifers. Thinning treatments would utilize variable density thinning to increase timber stand and landscape-level heterogeneity. Merchantable timber greater than 11 inches diameter at breast height (DBH) but not greater than 30 inches DBH and sub merchantable trees between 3 inches DBH and 11 inches DBH would be targeted for removal. All treated units will be considered for follow-up underburning to reduce duff and ground fuel levels as well as reintroduce fire into the forest ecosystem.

Mechanical equipment used for thinning may include tracked or wheeled feller-bunchers and skidders. Equipment would generally be restricted to slopes of 35 percent or less. Equipment would work on short pitches of slopes up to 45 percent outside of Riparian Conservation Areas. To the extent possible, existing skid trails and landings would be utilized to minimize new disturbance within the project area. Skid trails, designated stream crossings, landings, and temporary roads created to support mechanical thinning would be restored after implementation. Restoration may include one or more of the following: subsoiling or scarifying compacted surfaces, recontouring, installing drainage features like water bars, seeding and/or mulching with available material such as available slash to improve infiltration and minimize erosion.

Mechanical Fuels Treatments (598 acres)

Mechanical fuel treatments will remove small trees, shrubs, and dead and down material. These treatments could be utilized as both a stand-alone treatment and in combination with other treatments. Activities include grapple piling, mastication, and chipping. Grapple piling typically involves a tracked excavator that piles dead and down material, live brush, and live trees less than three inches DBH. Material resulting from fuels treatments may be removed, piled and burned, lopped and scattered, or masticated. Trailer mounted chippers would be used at landings to chip and remove the material. In areas where vegetation removal is not feasible due to accessibility or site sensitivity, a masticator or self-propelled chipper may be used to shred or grind vegetation and leave on the site.

Hand Thinning (397 acres)

Generally, hand thinning involves the use of chainsaws to cut trees up to 10 inches DBH but may cut larger trees to meet project objectives, particularly in aspen stands and meadows. Cut trees could be piled for burning at a later time, bucked for firewood, chipped and removed, or lopped and scattered.

Aspen Stand Improvements

Specific prescriptions within the proposed treatment units (e.g., mechanical thinning) designed to improve aspen stands include conifer removal and prescribed fire. All conifers could be removed from within aspen stands, including trees greater than 30 inches DBH. Some conifers could be left standing as snags or be felled and left as downed wood to create wildlife habitat. Conifers up to 150 feet around aspen stands would also be removed. Approximately 268 acres of aspen stands within the above vegetation treatment units have been identified for improvement but more may be identified during implementation planning. A maximum of 400 acres could be treated for aspen improvement. Aspen

stands within identified treatment units (e.g., mechanical thinning) exhibiting degraded condition could be selected for treatment. Prescribed fire would be intended as a secondary treatment in aspen stands following conifer removal.

Meadow Improvement

Within meadows, all conifer trees, including trees greater than 30 inches DBH, could be removed utilizing mechanical thinning, hand thinning, or prescribed fire. Where mechanical treatment is not feasible, trees would be hand-thinned and removed, lopped and scattered, and/or piled in the meadow. Piled material resulting from treatments would be burned. Prescribed fire within meadows would be considered as a primary and/or secondary treatment to reduce conifer regeneration, promote herbaceous vegetation, and reduce fuels. Meadow boundary delineators may include vegetation and soil composition, topography, changes in landform, or changes in soil moisture.

Approximately 25 acres of meadows within the above vegetation treatment units have been identified for improvement but more may be identified during the implementation planning process. A maximum of 40 acres could be treated for meadow improvement. Meadows in units that will use prescribed fire as the primary treatment are not included in the maximum acreage.

Spring Improvement

Specific prescriptions within the proposed treatment units (e.g., mechanical thinning) could remove conifers to improve water availability and increase surface flows of special aquatic features such as springs. All conifers less than 30 inches DBH may be removed from within 100 feet of special aquatic features such as springs. Trees greater than 30 inches DBH may be removed in limited circumstances where needed to meet improvement objectives. Hand-thinning would be utilized where mechanical treatment is not feasible, and material would be piled and burned, bucked for firewood, left as downed wood, or lopped and scattered. Currently, no spring features have been identified within the above vegetation treatment units; if springs or other special aquatic features are found within the above vegetation treatment units during the implementation planning process, they could be treated for improvement. A maximum of 20 acres could be treated for spring improvement.

Prescribed Fire

Prescribed fire could be used as a follow-up treatment on up to 4,331 acres. Due to logistical constraints, it is likely that many units will not receive prescribed fire following other treatments, however, there is the potential to burn these units if the opportunity arises. Prescribed fire would be planned to be low to moderate intensity. Burn plans would be developed to identify consumption goals, acceptable levels of tree mortality, large tree and snag protection, and large debris retention. Areas may receive hand thinning pretreatments to meet burn plan goals. Existing roads and natural barriers would be utilized as fire lines to minimize new ground disturbance although additional improvements or fire line construction around the burn area perimeter may be necessary. All constructed fire lines would be rehabilitated after implementation following Best Management Practices (USDA 2012) and project-specific design elements. Prescribed fire and pile burning would occur over multiple years, depending on fuel and weather conditions.

Road Improvements and Obliteration

The project proposes to repair, maintain, and/or reconstruct National Forest System Roads that are contributing to watershed impacts. Action would be taken to improve road drainage, reduce erosion caused by concentrated road runoff, and reduce sedimentation from roads into the stream network. Road treatments would be prioritized in areas with insufficient drainage, issues with water crossings, and roads contributing direct sedimentation to waterways.

Reconstruction would involve the widening of curves, excavating and/or placing fill material to reshape the roadbed so that runoff is less concentrated. Road dips with rock armored outlets may be

installed to better disperse runoff from road surfaces. Construction of armored overflow dips at certain culverts would ensure that if the culvert is plugged, stream diversion along the road would be minimal. Additional improvements may include out-sloping road segments, constructing low water crossings, installation of rip-rap aprons on fill slopes, and replacing culverts.

Road maintenance may consist of installation of road dips to better disperse runoff from road surfaces, brushing, blading the road surface, and improving drainage.

Approximately 5 miles of routes not added to the National Forest System (NFS) transportation network within the project area are proposed for obliteration. Obliteration may involve recontouring, subsoiling or abandonment. Abandonment is appropriate where the road has become completely overgrown with vegetation. Obliteration may also involve removing drainage structures, restoring vegetative cover, blocking access, or some combination of these treatments. Obliterating roads would promote vegetative recovery, decrease compaction, increase infiltration into the roadbed, increase soil stability and reduce erosion.

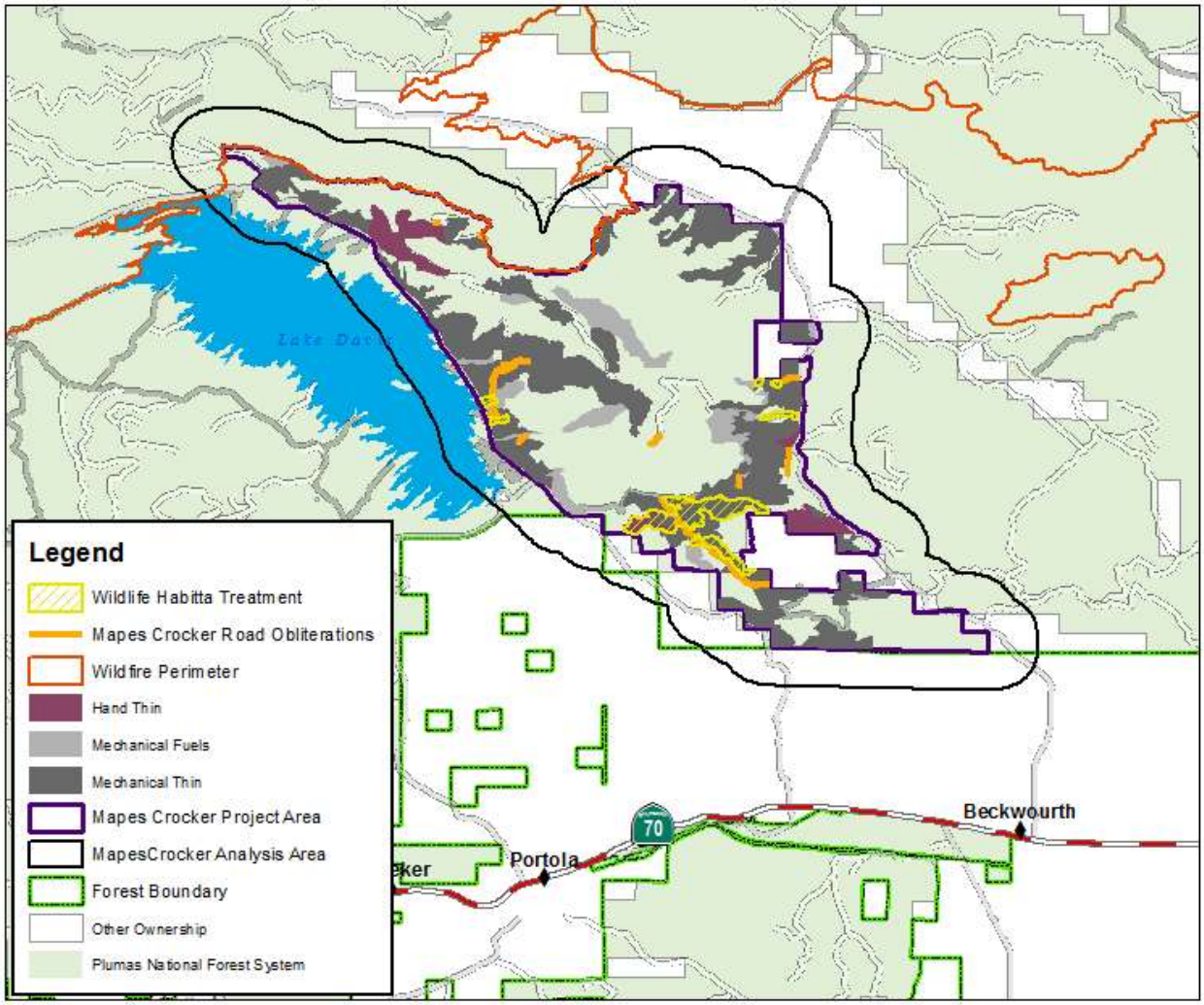

Figure 2. Mapes Crocker Wildlife Analysis Area and treatment types

General Environmental Consequences

Terrestrial Environment

Direct effects include immediate changes in habitat conditions, disturbance/ harassment to individuals, and direct mortality to individuals during project activities. Risk of direct disturbance, including mortality, to individual animals addressed in this report is mitigated by survey efforts for selected species, incorporation of Limited Operating Periods (LOPs) where appropriate, and implementation of Forest standards and guidelines. If presently unknown wildlife are discovered prior to or during implementation, and the species identified warrants a LOP, protections would be implemented. Indirect effects include effects that occur later in time or beyond the treatment area of the project. Indirect effects also may include effects to a species prey base.

In all proposed treatment types, noise disturbance and the presence of people and equipment could cause temporary disruption and/or displacement of wildlife species using areas within and adjacent to treatment units. Effects are anticipated to be short in duration and affected species are expected to return to the area and resume normal activities once project activities have subsided. Disturbance to breeding activities of sensitive species would be minimized through the implementation of LOPs for project activities. The direct effects of implementing the Proposed Action would primarily consist of changes to habitat conditions.

Vegetation Treatments

Mechanical Thinning

Direct and indirect effects due to mechanical thinning are expected to have short- to mid-term negative effects (20-50 years) on closed-canopy associated species due to a reduction in quantity and/or quality of habitat. Short term beneficial effects are expected for species that prefer open forested stands, as this type of habitat would increase. Long-term effects are expected to be generally beneficial for green forest associated species, due to an increase in the resiliency of stands to insects, disease, and stand-replacing wildfire.

Additionally, treatments should have beneficial effects for late seral associated species by promoting the growth of mid-seral stands into late-seral habitat and by increasing the resiliency of these stands. The long-term effect should be healthier trees, growing into the larger size class 5 and able to withstand periodic drought, insect outbreaks, and/or fires. Additionally, mechanical thinning would be conducted using variable density thinning (VDT) prescriptions, which promote vertical and horizontal heterogeneity that may be beneficial to wildlife.

Mechanical thinning would result in the removal of snags and disruption and removal of down woody material through normal operations. Snags and large woody debris are important habitat components for wildlife that depend on them for nesting, denning, and resting structures. Removal of snags and large woody debris may also negatively impact important prey species for Sensitive wildlife. Project design elements and forest-wide standards and guidelines for retention of these features would partially mitigate effects. Standards and guidelines for the retention of large logs as described in the 2004 SNFPA FSEIS ROD are designed to meet the needs of wildlife (Table 9).

Mechanical thinning with biomass removal simplifies the complexity and structure of forested stands, which can have negative impacts on species which prefer complex habitat for denning and nesting. Removing the lower and mid-level vegetative layers affects stand structure by reducing vegetative layering, small snags, and the diversity of microclimates within a stand that some species depend on to control exposure to predators and changes in ambient temperature. Linear openings

created by mechanical equipment used to remove timber and biomass reduce canopy cover even more and contribute to potential fragmentation of dense canopy cover habitat.

An EPA approved borate compound formulation of either Sporax or Cellu-treat will be applied to stumps to minimize the infection of Annosus root rot. Based on the Pesticide Fact Sheet prepared by Syracuse Environmental Research Associates, Inc. (2016), the application rate used by the Forest Service is considered non-toxic to vertebrate species, although extensive research has not been done. It is not known to build up (bioaccumulate) in fish, inferring no build up occurs in other vertebrate species. See the *Soil and Water Resource Effects for Common Vegetation Management and Road / Motorized Trail Treatments* (USDA 2021) for more information.

Mechanical Fuels Treatments

Direct and indirect effects of mechanical fuels treatments (mastication, grapple piling, chipping) under the Proposed Action are expected to have short-term negative effects to species that prefer early seral habitat or a complex understory in mid to late seral habitat due to habitat modification.

Brush and small tree habitat, when too thick can prevent wildlife from utilizing it. Treating brush fields and thickets of small diameter trees in a mosaic pattern, would create greater variation in age structure and successional stages which would add to the habitat diversity in the Wildlife Analysis Area, and increase the overall utility of early-seral habitat.

Aspen Stand Improvement

Aspen stands are centers of biodiversity on the landscape and provide important foraging and breeding habitat for a diverse array of wildlife species. Due to the presence of relatively moist conditions and abundant flora, aspen stands support a wide range of both transitory and resident wildlife species (Manley et al. 2000), including insects, birds, and mammals. Improving aspen stands throughout the project area is expected to be beneficial to wildlife in general.

Aspen stand improvements could have short-term negative effects to species present during implementation due to disturbance or disruption of breeding activities. Habitat modification due to removal of conifers within the 150-buffer would include the removal of large trees (>30 inches DBH), which are currently limited on the landscape. Project-specific design elements would be implemented to retain a maximum of 2 large trees per acre with desirable characteristics within these buffers in order to retain a large tree component while reducing the potential for future conifer encroachment into aspen stands. If trees meeting this description do not exist, none would be retained.

Meadow Improvement

Improving meadow habitat throughout the project area is expected to create more favorable conditions for species dependent on this habitat type for all, or a portion, of their life cycle. Healthy meadows contain a high diversity of plant species which create important microhabitats and food sources for wildlife, including insects and pollinators which benefit the entire ecosystem. Meadows are of particular importance for invertebrates, a key food source for many birds, amphibians, and reptiles. Removal of encroaching conifer trees within meadows can mimic the ecological role of fire and is expected to improve meadow function and condition. Removing conifers from meadow interiors and meadow edges allows more sunlight and nutrients to be available to herbaceous vegetation, and likely increases water availability as well. Removing encroaching conifers from meadow edges would restore the meadow to its full size potential and increase meadow/forest edge habitat important to some species.

Additionally, thinning conifers within a buffer around the meadow will reduce the conifer seed source and slow future encroachment. Of the trees that remain along the meadow edge, a reduction in competition will encourage growth of larger trees which is favorable for many species associated with meadow-forest edge habitat.

Spring Improvement

Removing encroaching conifers from around springs or other special aquatic features is expected to be beneficial to most species of wildlife by increasing water availability. The Mapes Crocker project is located east of the Sierra crest where water is a limiting resource.

Hand Thinning

Hand thinning of ≤10" DBH conifers in mid to late seral forest habitat would generally result in little or often no impact on current canopy covers and has the most positive effect on removing hazardous fuels. Any losses in canopy cover incurred within this part of the understory would be regained in the overstory as reduced competition for resources allows residual trees to grow faster. However, hand thinning could result in simplifying the understory as discussed above for mechanical thinning.

Prescribed Fire

Prescribed fire is generally considered beneficial to many wildlife species when conducted at low to moderate intensity. There could be limited impacts to wildlife in the short term, such as disturbance or mortality to individuals. However, species in the Sierra Nevada region have evolved with fire as a natural part of the ecosystem and are resilient to low intensity fire. Prescribed fires decrease future fire hazard by reducing the buildup of hazardous fuels and potentially reducing the long-term, negative effects of a high-intensity wildfire to species dependent on green forest habitat. Prescribed fire also regenerates forb and grassland communities which in turn provide forage for many wildlife species, and their prey.

Prescribed fire may cause a loss in the availability of snags and large woody debris. Additional snags may be recruited through burning, which could also result in the addition of large woody debris post-burning. However, these habitat features would not be immediately available for use by many species as it would take time for snags to decay before they could be used to create cavities or become woody debris on the ground.

Short term effects on meadow vegetation from prescribed fire would be offset by the new flush of growth that follows fire. The loss of vegetation can reduce thatching and ground cover and promote new growth and increase species diversity.

Road Treatments

These activities will have both negative and positive effects on the terrestrial environment. Maintenance activities would create noise and ground disturbance during all activities. Roads contribute to habitat fragmentation, spread of noxious weeds, noise pollution and littering via traffic and human presence, and wildlife mortality/injury. Construction of new temporary roads to access treatment units would increase these effects, however once the temporary roads are no longer needed for the Mapes Crocker Project, they would be decommissioned. There would be a slight reduction in habitat and habitat connectivity through brush removal and road widening. Improved roads could also result in more public traffic. Positive effects of road improvement would be long-term reduction of erosion from road degradation. The removal of brush increases visibility along the road margin, possibly reducing wildlife mortality/injury. Further, improved road conditions ensure public passage remains on the roadbed rather than trying to find an alternative means around a degraded section of road.

Decommissioning roads promote vegetative recovery, improve habitat connectivity, and reduce human impact such as removal of snags and logs for fuelwood, noise pollution, and overall disturbance. In addition, the proposed non-system road removal will reduce road densities, which is beneficial to all wildlife species.

Aquatic Environment

Direct effects include immediate changes in habitat conditions, disturbance/harassment to individuals, and direct mortality to individuals during project activities. In general, direct and indirect effects to the aquatic environment from the Mapes Crocker Project would be minimal as all Best Management Practices (BMPs), Standards and Guidelines (S&Gs), and project design elements to protect water quality would be adhered to. Riparian Conservation Areas (RCAs) will be managed consistent with the SNFPA ROD (USDA 2004) Riparian Conservation Objectives (RCOs) and associated standards and guidelines. All applicable Best Management Practices (BMPs), S&Gs, and project specific design elements will be followed.

Within RCAs, proposed treatments include mechanical thinning, grapple piling, hand thinning, and prescribed fire. Mechanical equipment will enter RCAs except within equipment exclusion zones as defined by the hydrologist and for protection of Sierra Nevada yellow-legged frog habitat (See the Mapes Crocker Project Biological Assessment and the Mapes Crocker Project Hydrology and Soils Report).

Vegetation Treatments

Mechanical Thinning and Mechanical Fuels Treatments

Direct effects to aquatic species in perennial and intermittent streams such as injury or mortality from heavy equipment could occur during implementation of activities near aquatic habitat. However, equipment exclusion zones would partially mitigate potential direct effects. Harassment or disturbance of individuals due to project activity (e.g. noise disturbance and ground vibration) near habitat could directly affect the species.

Vegetation management in the uplands can potentially change the hydrologic regime in the area. Soil erosion could direct sedimentation into streams that could create short-term unsuitable water quality that could disrupt habitat use by aquatic species. This treatment may initially increase sediment runoff due to disturbed soil and removed vegetative cover, however, as the remaining trees increase growth and the soil becomes stabilized, reduced canopy cover would increase soil interception of precipitation and could therefore increase ground water recharge. This is a benefit to sensitive amphibians and cold water fisheries habitat because reduced runoff and increased ground water retention could provide cold water later into the summer and fall season. With the implementation of S&Gs, BMPs, and project design elements, it is expected that there would be no disruption in flows and minimal short-term sedimentation into streams. See the Mapes Crocker Project hydrology and soils report for more information.

Aspen Stand Improvement

Restoring aspen stands through removal of encroaching conifers is identified as a Riparian Conservation Objective in the FEIS SNFPA ROD (USDA 2004). Removal of conifers encroaching into aspen stands would be beneficial to riparian ecosystems and associated aquatic species. Short-term effects including increased sedimentation could occur during the implementation phase but are expected to be of short duration. Equipment exclusion zones and project design elements identified to protect the Federally endangered Sierra Nevada yellow-legged frog would provide protection to water quality and all aquatic species during implementation.

Meadow Improvement

Meadows play an important role in carbon sequestration and water filtering, and contribute to habitat diversity on the landscape. Healthy meadows store water that is released back into the streams in the fall as vegetation dies out or goes dormant for winter. Removal of encroaching conifers within the

meadow and thinning the meadow boundary is expected to have a beneficial effect on meadows, allow for the expansion of meadow and riparian vegetation, and preserve and potentially enhance meadow hydrologic function. Meadow improvement is expected to be beneficial to aquatic species.

Short term effects include initial increased sediment runoff and potential increase in release of carbon and other nutrients into aquatic features. The release of sediment into stream courses would be short-term and resolved when vegetation recovers. The amount of carbon and other nutrients released is expected to be nominal, with increased amounts at the point of release and then quickly dissipating downstream.

Spring Improvement

Removing encroaching conifers from special aquatic features such as springs would be beneficial to aquatic species. Removing conifers, especially juniper, would increase water availability in these habitats. Equipment exclusion zones and project design elements identified to protect the Federally endangered Sierra Nevada yellow-legged frog would provide protection to water quality and all aquatic species during implementation.

Hand Thinning

Hand thinning could result in harassment or disturbance of individuals due to increased noise and human presence, and rarely in direct injury or mortality due to crushing. Hand thinning is not expected to directly affect habitat in the aquatic environment. Removal of small conifers could result in changes to the microclimate of a site. Hand thinning could have beneficial effects if treatments reduce the risk of high-severity fire from burning through the area.

Prescribed fire

There could be direct effects from prescribed fire that is allowed to creep or back into aquatic environments. There is a small potential for the modification of streamside vegetation and loss of duff layer due to prescribed fire in riparian areas. However, aquatic environments do not readily burn and therefore most of the vegetation is left intact. Impacts from prescribed fires are expected to be short lived. Fire intensity should be low enough to allow some retention of duff layer and riparian vegetation that would prevent soil erosion and expedite recovery. With the implementation of project design elements and BMPs, the effects of prescribed burning would be negligible.

Prescribed fire and thinning treatments proposed within RCAs would release existing conifers to grow into larger diameter trees and thus be retained for future wildlife habitat and natural recruitment of large woody debris into stream channels. The indirect effects of sediment reaching stream courses will be minimized through implementation of BMPs, S&Gs, and project design elements.

Road Treatments

These activities will have both negative and positive effects on the aquatic environment. Negative impacts are expected to be short term, associated with temporary road construction and initial increased sediment runoff following road repairs and road obliterations. Long term beneficial effects are expected due to improved drainage and reduced road density.

Roads contribute to sedimentation of streams and watersheds, reduce water quality, obstruct natural hydrology, hinder wildlife movement, and increase public impact to the landscape. Construction of new temporary roads to access treatment units would increase these effects, however once the temporary roads are no longer needed for the Mapes Crocker Project, they would be decommissioned.

Non-system roads are not maintained and are subject to washouts and rutting that redirect water flow with their continued use. Decommissioning non-system roads reduces these negative impacts by returning the roadbed to its natural state. Decommissioning roads would promote vegetative recovery, which could decrease compaction, increase infiltration into the roadbed, increase soil stability, and limit

concentrated flow and surface erosion. Over time, these areas would produce less sediment and surface runoff to adjacent watercourses. The activities may generate more sediment in streams in the short term, but in the long term the removal or maintenance of these roads will result in less sedimentation and reduced public impacts. All S&Gs, BMPs, and project design elements for road construction, maintenance, and obliteration will be followed to minimize impacts to aquatic environments.

General Cumulative Effects

The existing condition reflects the landscape changes from all activities that have occurred in the past. The analysis of cumulative effects of the proposed action evaluates the impact on TES habitat from the existing condition within the aquatic and terrestrial Wildlife Analysis Areas. See Appendix C for a table of ongoing and reasonably foreseeable projects which may contribute to the cumulative effects of the Mapes Crocker Project.

The Dixie Fire burned through approximately 9% of the Mapes Crocker Project area at mixed but primarily high severity. Additionally, approximately 830,000 acres (58%) of Plumas National Forest lands burned in wildfires (including the Dixie Fire) between 2019-2021. These wildfires resulted in the loss of late- and mid-seral habitat. Species displaced by fire seeking refugia in the Mapes Crocker Project Area could be further impacted by project activities and cause effects to a degree not expected based on project activities alone. Cumulative impacts to water quality and sedimentation could occur as a result of fire impacts in combination with project activities. Standards and guidelines (S&Gs), best management practices (BMPs) and project design elements will be implemented to protect water quality during project implementation.

Climate change has the potential to impact species distribution and habitat availability. Fires are expected to become more frequent and more intense (Cayan et al 2006; Battles et al 2006; Mallek et al 2013) as demonstrated by wildfires in the last three years which burned approximately 58% of PNF including the Dixie Fire in 2021 which burned a total of 963,309 acres on Plumas and Lassen National Forests combined. Higher fire activity will adversely affect important habitat components such as large tree densities and canopy cover. Fires also increase snag and surface woody debris in the short term (5-20 years), but increased frequencies of fire ultimately reduce these important habitat components over the long term because large trees are not available to recruit new snags and logs over time. In addition, productivity of conifers in a warmer climate, particularly pines, would be greatly reduced, slowing recovery of forest habitats. Previously forested stands affected by high-intensity fire may not be able to reestablish on the same site due to changed climate conditions. Species associated with late seral high canopy cover habitat would likely be negatively impacted, while early seral associated species may benefit. Due to warming climatic conditions, species may experience a contraction of available habitat as warming conditions drive a shift to higher elevations.

Ongoing and Reasonably Foreseeable Future Actions

Present and future projects implemented in the area are guided by the direction found in the Plumas LRMP and SNFPA (USDA 1988 and 2004). Ongoing and planned future vegetation management activities on NFS lands include the Dixie Fire Deck Sale which would remove green trees cut during fire suppression efforts and could result in additional disturbance to nearby wildlife.

Two grazing allotments overlap with the Mapes Crocker wildlife analysis area. Potential effects to the terrestrial environment include overgrazing and degradation of meadow vegetation and water quality. Grazing S&Gs and grazing permits are designed to minimize the impacts by livestock and keep the integrity of the landscape and waterways intact.

The fuelwood gathering and Christmas tree cutting programs on the PNF are ongoing programs that have been in existence for years and are expected to continue. These programs allow the public to purchase a permit to remove firewood and Christmas trees (Sapling tree 1 - 6" DBH) from National Forest System lands. In 2019, approximately 698 personal and commercial woodcutting permits were issued for the BKRD allowing the removal of 2,490 cords of wood in the form of snags and down logs. Approximately 2,363 Christmas tree permits were sold on the Beckwourth Ranger District in 2019; approximately 10,200 Christmas tree permits were issued in 2020 when the Plumas National Forest offered online permits for the first time due to the COVID-19 pandemic. The Mapes Crocker project area, as well as the wildlife analysis areas, is open to woodcutting and Christmas tree cutting but amounts are not quantifiable. This area is heavily used by the public and there is an ongoing problem of green trees being cut as well as snags for fuelwood. These activities are expected to continue, resulting in the cumulative loss of these habitat components across the landscape. Snag and log removal are most common along, or within a short distance from, open roads. Obliteration of roads under the proposed action would reduce the area accessible for woodcutting. The past and future effect of these actions has been and would be to remove habitat structure used by wildlife.

Most of the recreation use within the wildlife analysis area consists of hiking, mountain biking, ATV riding, hunting, fishing, camping, pleasure driving, and wildlife watching. The Lake Davis area especially is a popular recreation destination and receives heavy visitor use; there are two campgrounds within the analysis area and an annual bicycle race event. These uses are expected to continue. The true extent and effect of these activities on terrestrial and aquatic species is not known.

Affected Environment/Environmental Consequences for Sensitive Species

Western bumble bee (*Bombus occidentalis*)

Exisiting Condition

Population Status

Historically, the western bumble bee was one of the most broadly distributed bumble bee species in North America, distributed along the Pacific Coast from Alaska to California and westward to the Colorado Rocky Mountains (Thorp and Shepard 2005, Cameron et al. 2011, Koch et al. 2012). The western bumble bee currently occurs in California and all adjacent states, but is experiencing severe declines in distribution and abundance due to a variety of factors including diseases and loss of genetic diversity (Tommasi et al. 2004, Cameron et al. 2011, Koch et al. 2012). Although the general distribution trend is steeply downward, especially in the west coast states, some isolated populations in Oregon and the Rocky Mountains appear stable (Rao et al. 2011, Koch et al. 2012). The overall status of populations in the west is largely dependent on geographic region: populations west of the Cascade and Sierra Nevada mountains are experiencing dire circumstances with steeply declining numbers, while those to the east of this dividing line are more secure with relatively unchanged population sizes. The reasons for these differences are not known.

The western bumble bee populations and their habitats are threatened by diverse factors, including but not limited to habitat loss and fragmentation, contaminants, parasites, and habitat alteration resulting from fire suppression. Other habitat alteration (e.g., agricultural and urban development) may fragment or reduce the availability of flowers that produce nectar and pollen bumble bees require, and

habitat alteration also may decrease the number of abandoned rodent burrows that provide nest and hibernation sites for queens. Invasive species also are impacting the western bumble bee, as bumble bees introduced from Europe for commercial pollination apparently carried a microsporidian parasite, *Nosema bombi*, which has been introduced into and impacted native bumble bee populations (Cameron et al. 2011). Exposure to organophosphate, carbamate, pyrethroid and particularly neonicotinoid insecticides has recently been identified as a major contributor to the decline of many pollinating bees, including honey bees and bumble bees (Henry et al. 2012, Hopwood et al. 2012). Further, fire suppression in many systems has permitted native conifers to encroach upon meadows, which decreases foraging and nesting habitat.

Habitat Requirements

The western bumble bee is currently managed as a USDA Forest Service sensitive species in accordance with the proposed USFS Region 5 2013 update. Queens overwinter in the ground in abandoned rodent (i.e., mouse, chipmunk or vole) nests at depths from 6-18 inches and typically emerge about mid-March (Heinrich 1979). Foraging individuals are largely absent by the end of September, and those that emerge from unfertilized eggs become males, which do not forage and only serve the function of reproducing with newly emerged queens (Heinrich 1979). Bumble bees may continue to forage when temperatures are below freezing even in inclement weather (Heinrich 1979).

Western bumble bees have a short proboscis or tongue length relative to other co-occurring bumble bee species, which restricts nectar gathering to flowers with short corolla lengths and limits the variety of flower species it is able to exploit. Western bumble bees have been observed taking nectar from a variety of flowering plants, including: *Aster* spp., *Brassica* spp., *Centaurea* spp., *Cimicifuga arizonica, Corydalis caseana*, *Chrysothamnus* spp. (now *Ericameria*), *Cirsium* spp., *Cosmos* spp., *Dahlia* spp., *Delphinium nuttallianum*, *Erica carnea, Erythronium grandiflorum*, *Foeniculum* spp., *Gaultheria shallon*, *Geranium* spp., *Gladiolus* spp., *Grindelia* spp., *Haplopappus* spp., *Hedysarum alpinum*, *Hypochoeris* spp., *Ipomopsis aggregata*, *Lathyrus* spp., *Linaria vulgaris*, *Lotus* spp., *Lupinus monticola*, *Mentha* spp., *Medicago* spp., *Melilotus* spp., *Mertensia ciliata*, *Monardella* spp., *Nama* spp., *Origanum* spp., *Orthocarpus* spp., *Pedicularis capitata, P. kanei, P. langsdorfii, P. groenlandica, Penstemon procerus*, *Phacelia* spp., *Prunus* spp., *Raphanus* spp., *Rhododendron* spp., *Salix* spp., *Salvia* spp., *Solidago* spp., *Symphoricarpos* spp., *Tanacetum* spp., *Taraxacum* spp., *Trifolium dasyphyllum, Trichostema* spp., *Trifolium* spp. and *Zea* spp. (Evans et al. 2008).

Analysis Area Surveys

Surveys for the western bumble bee have not been conducted in the Mapes Crocker Project area. However, at least 22 of the plant species listed above are known to occur within the Wildlife Analysis Area, therefore, presence is assumed.

Environmental Consequences – Western bumble bee

Alternative A – Proposed Action

Although potential direct effects on the western bumble bee include mortality of individuals or entire nesting colonies, it is difficult to precisely quantify the risk of and occurrence of such events for this species. We therefore focused on three management questions regarding the western bumble bee while designing and evaluating potential environmental consequences of the Mapes Crocker Project:

1. Do bumble bees have continuous access to flowering plants from spring through autumn?

2. Does adequate habitat for nesting and overwintering sites exist (undisturbed areas with logs and clumps of grass)?
3. Are floral resources and nesting habitat fragmented or isolated in distribution? (e.g., is nesting habitat in close proximity to foraging habitat?).

Vegetation Treatments

Mechanical Thinning

Flowering plant species (nectar sources) known to be used by the western bumble bee occur at various degrees throughout the analysis area. Within the general forest treatment units, overstocking of trees and high fuel loading prevents favorable growing conditions for flowers. Mechanical treatment activities associated with the Mapes Crocker Project can potentially cause short-term direct negative effects to foraging habitat for bees by crushing flowering plants. Any direct disturbance to existing flowering plants would likely be ephemeral as flowering plants will regenerate post-project. Opening the forest canopy would allow more sunlight and moisture to reach the ground, allowing an increase in flowering plants and foraging opportunities for the western bumble bee.

Ground disturbing activities also may destroy occupied nests, suitable nesting and overwintering sites for the western bumble bee within treatment units. Throughout the project, both spatially and temporally, there would be habitat refugia for the western bumble bee via clumps of no treatment and RCA equipment exclusion zones. Therefore, suitable nesting and overwintering sites are expected to persist throughout the length of the project. Further, given the linear nature of RCAs, equipment exclusion zones within RCAs also serve as habitat corridors for the western bumble bee, providing habitat connectivity between and among foraging and nesting habitat. In addition, units are not all harvested at once, so ground disturbance is on a small area at any given time.

Fungicide will be applied to stumps within a day post tree removal to prevent the spread of Annosus root rot. Although it is an insecticide, it is believed that, with the method of application (i.e., treating each individual stump versus broadcast application) and the amount used, these compounds applied to stumps should not affect the western bumble bee.

Mechanical Fuels Treatments

Direct effects include disturbance to individuals and occupied nests due to equipment and project activities. Potential effects due to mechanical fuels treatments would be similar to those for mechanical thinning (see above). Mechanical fuels treatments are expected to have long-term benefit to bumble bee habitat by allowing more sunlight and moisture to reach the ground, allowing an increase in flowering plants and foraging opportunities.

Aspen Stand Improvement

Aspen stand improvement is anticipated to be beneficial to western bumble bees. Aspen stands support a greater abundance of plant species than conifer stands or even meadows (Kuhn et al. 2011). This diversity would likely benefit bumblebees by providing floral resources that would not be available if the aspen stands were converted to conifer stands through encroachment.

Meadow Improvement

Direct and indirect effects of mechanical thinning in meadow buffer areas would be as described for mechanical thinning above. Removal of conifers within the meadow may disturb individuals and cause disturbance to habitat. These effects are expected be short term, within the duration of the activity, and plants are expected to return the same or following season depending on timing of treatments.

Removal of encroaching conifers within the meadow and thinning of trees within the meadow boundary are expected to have a beneficial effect on bumble bee habitat. Conifers have the potential to dewater meadows and lower the water table allowing for accelerated encroachment of other conifers and upland shrubs, altering the habitat. Overall, there would be beneficial effects for the western bumble bee from conifer removal along meadow borders. Removing conifers allows more sunlight and nutrients to be available to flowering plants, increasing the number and vigor of flowers for foraging bees. The removal of conifers within the meadow buffer will help slow future conifer encroachment in the meadow. Removal of conifers will allow for the expansion of meadow and riparian vegetation and preserve and enhance meadow health and function. Overall, meadow improvement is expected to provide increased foraging habitat for bumble bees.

Spring Improvement

Spring improvements are expected to be beneficial to western bumble bees by providing increased water availability to habitat that may support floral resources. Direct and indirect effects as described above could occur during implementation but would be of short duration.

Hand Thinning

Effects due to hand thinning are expected to be minimal. Hand thinning activities are unlikely to destroy underground nesting opportunities or have measurable effects on the availability of floral resources.

Prescribed Fire

Prescribed fire is planned in approximately 44 acres of meadow habitat as a follow-up to other treatments. Direct effects to individuals could occur due to high soil temperatures during prescribed fire if prescribed burning takes place when over-wintering queens residing underground are present. However, prescribed fire in meadows will be generally beneficial to bumble bee habitat, as the new growth that follows a burn could improve foraging habitat.

Road Treatments

Most road maintenance activities will have no effect on western bumble bees except brush removal. Brush removal involves removing vegetation along the margins of the road that are encroaching the roadway and reducing driver visibility. Removal of flowering plants along roadways could result in a reduction in foraging habitat, but this reduction is considered negligible. In addition, reducing flowering vegetation along the roadway could reduce vehicle caused mortality of bees.

The temporary road construction needed for project access has the potential to disturb or cause destruction of nest sites of bumble bees. All temporary roads will be decommissioned when no longer needed for the project, therefore any impacts of temporary roads are expected to last the duration of the project and up to 5 years post project, for the vegetation to reestablish.

Road decommissioning may temporarily disturb bees but could be beneficial if road surfaces revegetate with native flowering species.

Cumulative Effects

There are no known cumulative effects beyond those listed under General Environmental Consequences (see above). These uses are expected to continue. The true extent and effect of these activities on the western bumble bee is not known.

Alternative B – No Action

There would be no direct effects on *B. occidentalis* or its habitat, as no activities would occur that would cause disturbance to nesting or foraging bees, nor any impacts to the existing habitat conditions.

However, no action would result in further encroachment of conifers in meadows and further densification of the forest, resulting in loss of suitable foraging habitat through shading out of flowering plant species. In the long-term, no action could have negative effects to bumble bee habitat.

Determinations - Western Bumble bee

The proposed action (Alternative A) for the Mapes Crocker Project may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for the western bumble bee. Wildlife habitat improvements in and adjacent to aspens, meadows, and springs are expected to have long-term benefits to western bumble bee habitat.

The no action alternative (Alternative B) for the Mapes Crocker Project will not affect western bumblebees.

Foothill Yellow-legged Frog (*Rana boylii*)

Existing Condition

Population Status

The foothill yellow-legged frog (FYLF) is currently a species proposed for listing under the federal Endangered Species Act (ESA) of 1973. On December 28, 2021 the U.S. Fish and Wildlife Service (USFWS) published a proposed rule to list four of six distinct population segments (DPSs) of the foothill yellow-legged frog (*Rana boylii*) under ESA, with the North Feather DPS (which overlaps Plumas National Forest) proposed to be listed as threatened. In December 2019 the California Fish and Game Commission listed the FYLF under the California Endangered Species Act (CESA) as threatened or endangered, or not listed, based on genetic clades which are geographically separated. The Mapes Crocker Project contains a portion of the Feather River clade, which was listed as threatened.

Threats to the population include habitat fragmentation due to anthropomorphic activities such as dams and altered flow regimes, chytrid fungus (*Batrachochytrium dendrobatidis*), introduction of non-native trout and bullfrogs, pesticide exposure, and climate change. Impacts associated with dams and altered flow regimes are widespread and significant. Climate change is expected to result in increased frequency and severity of natural disturbance events such as wildfire, droughts, floods, and landslides which can lead to local extirpations. Additional threats that can contribute to habitat degradation and population declines include mining, livestock grazing, recreational activities, urban and agricultural land use and expansion, cannabis cultivation, timber harvest, and some biological surveys and habitat restoration activities.

Habitat Requirements

Detailed descriptions of habitat requirements can be found in PSW-GTR-248 (Hayes et al. 2016) *Foothill Yellow-legged Frog Conservation Assessment in California*, the report to the California Fish and Game Commission: *A Status Review of the Foothill Yellow-legged Frog* (CDFW 2019) and the *Species Status Assessment Report for the Foothill Yellow-legged Frog* (USFWS 2021).

Perennial streams, intermittent streams with perennial pools, and ponds below 6,000 feet in elevation are considered suitable habitat for foothill yellow-legged frogs. These frogs prefer partial shade, shallow riffles, and cobble sized or greater substrate (Hayes and Jennings 1988, Morey and Papenfuss 1990). Occasionally, this species is also found in other riparian habitats, including moderately

vegetated backwaters, isolated pools, (Hayes and Jennings 1988, pers. observation), and slow moving rivers with mud substrates (Fitch 1938).

Most foothill yellow-legged frogs breed along mainstem water channels and overwinter along smaller tributaries of the mainstem channel; during the non-breeding season, the smaller tributaries, some of which may only flow during the wet winter season, provide refuge while the larger breeding channels may experience overbank flooding and high flows (USFWS 2021 and references therein). They are rarely seen more than a few meters away from water, but it remains unknown if they utilize upland areas during winter months (Kupferberg 1996). During the winter, frogs have been observed in abandoned rodent burrows and under logs (Zeiner et al. 1988). During large precipitation events, adults and juveniles have been observed moving upslope, away from the waterway, suggesting that they use upland areas temporarily as a strategy to avoid scouring flows (USFWS 2021 and references therein). Habitat use of juvenile frogs also is largely unknown. Some evidence indicates that they potentially use smaller waterways such has springs or small tributary streams (Lind et al. 2011). Recently metamorphosed frogs show a strong tendency to migrate upstream (Twitty 1967). Overwintering of larvae probably does not take place (Zweifel 1955).

Analysis Area Surveys

Visual encounter surveys (VES) for all amphibian species have been conducted over approximately 21 miles (70%) of perennial and intermittent stream habitat in the project area during project-specific surveys in 2019-2020. Surveys were conducted as described in A Standardized Protocol for Surveying Aquatic Amphibians (Fellers and Freel 1995) and received three visits. No FYLF were detected during these surveys and there are no known historical observations of FYLF within the analysis area.

Environmental consequences

Alternative A – Proposed Action

Vegetation Treatments

Mechanical Thinning, Mechanical Fuels Treatment

Direct effects including the killing or injuring of individuals from harvest machinery and tree felling, could occur. Harassment of individual frogs from thinning activity (e.g. noise disturbance and ground vibration) that occurs near occupied habitat could also directly affect the species. Indirect effects include increased sediment in streams that may impact downstream populations by increasing water temperature and turbidity thereby reducing the quality of the habitat.

Where surveys are complete and habitat is determined to be unoccupied by yellow-legged frogs (foothill or Sierra Nevada), mechanical equipment may be allowed to enter suitable habitat; where surveys are not complete mechanical equipment would not enter suitable habitat. Modified equipment exclusion buffers on aquatic habitat would be 50 feet for general forest mechanical thinning and mechanical fuels treatments. Reduced buffers for general forest treatments could result in short-term increases in sedimentation due to soil disturbance, but likely would have long-term beneficial effects to FYLF habitat if treatments result in reduced risk of high severity fire, which can negatively impact FYLF habitat through increased run-off and sedimentation post-fire. Direct impacts during project activities would be unlikely with the implementation of project design elements planned to protect the Federally endangered Sierra Nevada yellow-legged frog. Vegetation management in the uplands can potentially change the hydrologic regime in the area. Soil erosion could direct sedimentation into streams that could create short-term unsuitable water quality that could disrupt habitat use by this species. With the implementation of standards and guidelines, BMPs, and project design elements, there would be

minimal adverse direct and indirect effects to FYLF and potential habitat. It is anticipated that there would be no disruption in flows and minimal short-term sedimentation into streams.

Aspen Stand Improvement, Meadow Improvement, Spring Improvement

Direct and indirect effects of wildlife habitat treatments are the same as described above for mechanical treatments, and as described below for hand thinning treatments.

Where surveys are complete and habitat is determined to be unoccupied by yellow-legged frogs (foothill or Sierra Nevada), mechanical equipment may be allowed to enter suitable habitat; where surveys are not complete mechanical equipment would not enter suitable habitat. Modified equipment exclusion buffers on aquatic habitat would be 25 feet for wildlife habitat improvement treatments. The reduced buffer could result in short-term increases in sedimentation due to soil disturbance. However, wildlife habitat improvement treatments in aspen, meadows, and around springs are expected to have long-term beneficial effects to FYLF habitat, including improved basking habitat due to decreased canopy cover, and potentially increased water availability due to the removal of encroaching conifers.

Hand Thinning

Direct effects of hand thinning include the killing or injuring of individuals during thinning and pile burning activities. Harassment of individual frogs from thinning activity (e.g. noise disturbance) within or near habitat may also directly affect the species. Indirect effects include changes in the microclimate (reduced humidity, and increased air temperatures) due to thinning treatments.

Implementation of project design elements, S&Gs and BMPs would significantly reduce the probability of any adverse effects on individual frogs.

Prescribed fire

Direct effects due to prescribed fire include the killing or injuring of individuals due to burning. Indirect effects include changes in the microclimate (reduced humidity, and increased air temperatures) due to loss of riparian vegetation, loss of sheltering habitat due to consumption of woody debris, and increased sedimentation to the stream channel due to increased overland flows.

There is a small potential for the modification of streamside vegetation and loss of duff layer due to prescribed fire in riparian areas. However, any impacts from prescribed fires are expected to be short lived. Fire intensity should be low enough to allow some retention of duff layer and riparian vegetation that would prevent soil erosion and expedite recovery.

All thinning units are considered for post-treatment prescribed fire. With the implementation of project design elements and BMPs, the effects of prescribed burning would be negligible.

Road Treatments

Direct effects include mortality due to crushing or drafting during road construction, removal, or maintenance activities. Indirect effects include changes to water quality due to sedimentation. Increased sediment release could impact downstream habitat and/or populations.

Temporary road construction would increase the potential for soil movement and potential sedimentation into streams and aquatic habitats. Road obliterations would decrease compaction, increase percolation into the roadbed, increase soil stability and limit concentrated flow as well as surface erosion derived from temporary and non-system roads. The risk for negative impact is low considering the treatments would be isolated events of short duration occurring in isolated locations.

The use of water for dust abatement by drafting water from creeks particularly during the summer months may cause changes in the flow regimes and water quality, especially within deeper pools and off channel waterholes. Changes in flow regimes can result in changes in surface water elevations, exposing egg masses to air drying for short periods (early summer) to potentially longer periods of exposure later in the summer, resulting in loss of egg viability. There is also the potential for individual tadpoles, egg

masses, or amphibians to be taken up by the "drafting" process, resulting in mortality of individuals. Implementation of project design elements and BMPs would significantly reduce the probability of any adverse effects on frogs. Amphibian/fish protection devices such as suction strainer (2mm gauge or less) would be used during drafting operations to prevent entrainment of tadpoles, egg masses or amphibians.

Cumulative Effects

There are no known cumulative effects beyond those listed under General Environmental Consequences (see above). These uses are expected to continue. The true extent and effect of these activities on foothill yellow-legged frogs is not known.

During 2019 and 2021, wildfire burned through approximately 46% of the four subwatersheds that overlap with the project area. While the amount of area affected by fire within the analysis area is relatively small (approximately 9%), the larger impact to the watersheds may contribute to increased sedimentation and decreased water quality that could add to impacts from project activities.

Alternative B – No Action

There is no potential of directly affecting foothill yellow-legged frogs through crushing, changes in microclimate, and loss of recruitment of large woody debris within the project area. No additional direct or indirect effects would occur.

Existing conditions would continue within the analysis period. Erosion and sediment sources would not be repaired. Conditions contributing to risk of high-severity fire would continue to progress and the potential for a high intensity wildfire in the area would not be reduced. Any acres burned at high intensity could contribute to increased sedimentation, which would adversely affect aquatic habitats and potential breeding habitat for yellow-legged frogs.

Determinations - Foothill Yellow-Legged Frog

The proposed action (Alternative A) for the Mapes Crocker Project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability. My determination is based on the following:

- FYLF were not detected during recent surveys in the analysis area.
- Project design elements designed to protect endangered Sierra Nevada yellow-legged frogs would make direct effects unlikely.
- Prescribed fire allowed to back into suitable habitat is expected to be patchy and intensity light due to the inherent moist nature of the habitat.
- Road activities will be short in duration, minimal footprint, and equipment will stay on the roadbed.
- All S&Gs, BMPs, and other project design elements will be followed to minimize any potential impact to FYLF and suitable habitat.

The no action alternative (Alternative B) for the Mapes Crocker Project will not affect the Foothill yellow-legged frog.

Bald Eagle (*Haliaeetus leucocephalus*)

Existing Condition

Population Status

The Bald Eagle was previously listed as a federally threatened species, but has subsequently been removed from the list (August 8, 2007; Federal Register Vol.72, No. 130/Monday, July 9, 2007/Rules & Regulations), and is currently managed as a USDA Forest Service sensitive species and California state endangered species (CESA). There are generally two Bald Eagle habitat management zones (primary and secondary) associated with each eagle nesting territory on the PNF (PNF LRMP, Rx-11).

The breeding range of Bald Eagles in California is expanding, and the number of eagle pairs that occupy breeding territories also has increased (CDFW 2013). In 1977, Bald Eagles were reported to be nesting in eight counties. By the mid-1990's, Bald Eagles were found nesting in 28 of the 58 counties within California. Today, bald eagles are found in 41 of the 58 counties in California. Reintroduction programs have fostered the establishment of breeding pairs in several of these counties. The annual, nationwide Midwinter Bald Eagle Survey indicates that the State's winter population varies from year to year but is likely stable (>1,000 birds during some winters). From 1986–2005, results indicated a 1.2% increase in California's wintering Bald Eagle population. Typically, about half of the State's wintering Bald Eagles are found in the Klamath Basin along the California-Oregon border, the location of the largest winter concentration of Bald Eagles in the lower 48 states. Bald eagles are considered a permanent resident in Plumas County.

Pertinent regulatory history and status:

- 2007: Bald eagle delisted from the List of Endangered and Threatened Wildlife (USDI 2007d; 72 FR 37346). At the time of delisting, the bald eagle was placed on the USFS R5 Sensitive Species List. In anticipation of delisting the bald eagle, the U. S. Fish and Wildlife Service issued National Bald Eagle Management Guidelines (USDI 2007a), a regulatory definition of "disturb" under the Bald and Golden Eagle Protection Act (USDI 2007b; 72 FR 31132), and proposed new permit regulations to authorize take under the Bald and Golden Eagle Protection Act (USDI 2007c; 72 FR 31141).
- Bald eagles continue to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, as well as the California Endangered Species Act (CESA).

Habitat Requirements

Bald Eagles are piscivorous and generally require large bodies of water or free flowing rivers with abundant fish and adjacent perch sites. In California, Bald Eagles are not known to nest further than two miles from an open water body, (Lehman 1979, USDI 1986). In California, 73 percent of the nest sites were within 0.5 mile of a body of water, and 89 percent were within one mile; no nests were known to be further than two miles from an open water body (USDI 1986). Bald eagles often construct several nests within a territory and alternate between them from year to year. Up to five alternative nests may be constructed within a single territory (Ibid).

Trees selected for nesting are characteristically one of the largest in the stand with stout upper branches and large openings in the canopy that permit nest access (USDI 1986). Nest trees usually provide an unobstructed view of the associated water body and are often prominently located on the topography (Ibid). A survey of nest trees used in California found that about 71 percent were ponderosa pine (*Pinus ponderosa*), 16 percent were sugar pine (*Pinus lambertiana*), and 5 percent were incense cedar (*Calocedrus decurrens*), with the remaining 8 percent distributed among five other coniferous species (Lehman 1979). Live, mature trees with deformed tops are occasionally selected for nesting. Eagle nests may be located in snags, but most nests are probably constructed when trees were alive

(Anthony and Isaacs 1989). Nest tree characteristics in California have been defined by Lehman (1980) as being 41 to 46 inches in diameter at breast height and in excess of 100 feet tall.

Breeding is initiated as early as January 1 via courtship, pair bonding, and territory establishment, and normally ends approximately August 31, as the fledglings are no longer attached to the immediate nest site. This time frame may vary with local conditions and knowledge. Incubation may begin in late February to mid-March, with the nestling period extending to as late as the end of June. From June through August, the fledglings remain restricted to the nest until they are able to move around within their environment.

Primary use areas provide current nesting, roosting, and/or foraging habitat and protect historic/current nesting and roosting sites. Secondary use areas are managed for future nesting, roosting, and foraging sites and population expansion.

Analysis Area Surveys

Known territories in the analysis area are monitored annually. There are three bald eagle primary use areas and two secondary use areas present in the Wildlife Analysis Area. The nest site in the Bagley Pass Primary Use Area has not been known to be active since the 1980s and half of the area was burned in the Dixie Fire in 2021. Both of the other two territories (Lake Davis and Bluff Cove) successfully nested and reproduced in 2021.

Territory	Known years with nesting
Bagley Pass	1982
Bluff Cove	2014, 2017, 2020, 2021
Lake Davis	2015, 2016, 2017, 2018, 2019, 2020, 2021

Environmental consequences

Alternative A – Proposed Action

Negative effects to bald eagles may result from the modification or loss of habitat or habitat components, disturbance to individuals, and rarely from direct mortality. Disturbance associated with logging, temporary road construction, or other associated activities within or adjacent to occupied habitat may disrupt nesting, fledging, and foraging activities. The proposed action would not cut or remove nest trees. A Limited Operating Period (LOP) would be implemented from January 1 to August 31 within primary use areas as well as within 0.25 mile of an active nest. No heavy equipment operations or tree felling would be allowed during the LOP. The LOP is expected to partially mitigate effects from increased human activity and equipment noise.

Vegetation Treatments

Mechanical Thinning

The proposed action has the potential to reduce bald eagle habitat by removing large trees within territories and adjacent to Lake Davis. However, trees over 30 inches DBH will be retained in general forest treatments and a treatment prescription specific to bald eagle habitat (USDA 1988) will be applied to primary use areas which includes implementing a reduced canopy gap size (0.1 – 0.25 acre) to provide more contiguous cover. Additionally, trees with desirable wildlife characteristics, such as those with flat tops, would be retained, which could provide trees with suitable characteristics for future bald eagle nests. Project activities are expected to improve stand conditions in the long-term by moving conditions

toward a larger tree size class and reducing the potential for adverse effects from tree pathogens or high severity wildfire.

Mechanical Fuels Treatments

Mechanical fuels treatments are not expected to negatively impact bald eagle habitat and may have long-term beneficial effects if treatments reduce the risk of high severity, stand-replacing fire. Disturbance-related effects could occur as described above.

Aspen Stand Improvement

Direct and indirect effects would be similar to those described for mechanical thinning. Trees greater than 30 inches DBH could be removed from within a 150-foot buffer of aspen stands, which could negatively affect bald eagle habitat by removing large trees, which are currently limited on the landscape. Project design elements would retain some large trees with desirable characteristics for wildlife within the 150-foot buffer where they exist, although there is potential to remove all trees if no trees with desirable wildlife or old-growth characteristics exist. No aspen improvement treatments are planned within primary use areas.

Meadow Improvement

Meadow improvement treatments are not anticipated to have direct or indirect effects other than disturbance related effects described above.

Spring Improvement

Direct and indirect effects would be similar to those described for aspen stand improvements and mechanical thinning described above, as well as for hand thinning described below. Trees greater than 30 inches DBH may be removed from within 100 feet of the spring/special aquatic feature.

Hand Thinning

Hand thinning treatments are not expected to negatively impact bald eagle habitat and may have long-term beneficial effects if treatments reduce the risk of high severity, stand-replacing fire. Disturbance-related effects could occur as described above.

Prescribed Fire

Disturbance-related effects could occur as described above, including impacts due to smoke. The LOP is expected to partially mitigate effects.

Road Treatments

Disturbance-related effects could occur as described above. The LOP is expected to partially mitigate effects. No nest trees would be cut for the creation of temporary roads.

Cumulative Effects

There are no known cumulative effects beyond those listed under General Environmental Consequences (see above). These uses are expected to continue. The true extent and effect of these activities on bald eagles is not known.

Alternative B – No Action

There would be no direct effects on bald eagle or its habitat, as no activities would occur that would cause disturbance to nesting or foraging eagles, nor any impacts to the existing habitat conditions.

Existing conditions would continue within the analysis period. Conditions contributing to risk of high-severity fire would continue to progress and the potential for a high intensity wildfire in the area would not be reduced. High intensity fire could adversely affect the availability of suitable nesting habitat for bald eagles within the analysis area.

Determinations – Bald Eagle

The proposed action (Alternative A) for the Mapes Crocker Project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability. My determination is based on the following:

- Habitat suitability would not be reduced.
- Limited operating periods would reduce disturbance to nesting activity during project implementation.
- Important habitat attributes would be retained including large snags and trees with desirable characteristics.

The no action alternative (Alternative B) for the Mapes Crocker Project will not affect bald eagles.

California Spotted Owl (*Strix occidentalis occidentalis*)

Existing Condition

Population Status

The California Spotted Owl is currently managed as a USDA Forest Service sensitive species. The US Fish and Wildlife Service received two petitions (on December 22, 2014 and August 19, 2015) to list the California spotted owl as endangered or threatened under the Endangered Species Act. On November 8, 2019 the USFWS issued a 12-month finding that listing was not warranted (84 FR 60371, USDI 2019).

Mark-recapture data from long-term demography studies in the Sierra Nevada have indicated California spotted owl populations have declined within all three study areas on National Forests: Sierra (31 percent), Lassen (44 percent), and Eldorado (50 percent), while appearing to be stable or increasing within the Sequoia-Kings Canyon National Park demography study area (Conner et al. 2016, Tempel et al. 2014). Differences in population trends between the national forests and the national parks could be related to forest management strategies including logging and fire suppression practices (Blakesley et al. 2005, Seamans and Gutiérrez 2007, Tempel et al. 2014).

A detailed species account including life history, population status and threats can be found in Pacific Southwest Research Station General Technical Report 254 (PSW-GTR-254) *The California Spotted Owl: Current State of Knowledge* (Gutiérrez et al. 2017). The most significant threats are identified as:

1. Continued effects of forest management on both public and private land.
2. Increasing trends in large-scale, stand-replacing fire.
3. Invasion of barred owls.
4. Potential climate change direct effects on owl populations or climate-driven vegetation type conversions and increased fire activity.
5. Increasing human population growth and development.

Two additional issues that have the potential to become significant threats are illegal rodenticide use and West Nile virus.

It is uncertain whether and to what degree population declines are a result of recent management practices that created a more homogeneous forest, a history of more extensive and intensive management practices in previous decades (e.g., selective logging of large trees and snag removal), or a

natural change in a population that is currently higher than was supported under historical forest conditions.

Habitat Requirements

Detailed descriptions of habitat requirements and use can be found in PSW-GTR-254 (Gutiérrez et al. 2017), the Region 5 *Conservation Strategy for the California Spotted Owl in the Sierra Nevada* (R5-TP-043, USDA 2019), and 70 Federal Register 35607 of June 21, 2005 (USDI 2005).

In general, habitat is characterized by closed-canopy forest with complex structure, including multiple layers in the mid to upper canopies, and high canopy cover from large trees (Gutiérrez et al. 2017, North et al. 2017, Blakesley et al. 2005, Verner et al. 1992). High canopy cover (greater than 70 percent) and large trees are the most important factors for spotted owl nesting and roosting habitat (Bias and Gutierrez 1992, Moen and Gutierrez 1997, Blakesley et al. 2005, Tempel et al. 2014). Although canopy cover down to 40% is considered suitable for nesting and foraging, it is only marginally so, based on owl occurrence and productivity threshold at around 50% canopy cover. Territory occupancy is positively associated with canopy cover >70% and sharply declines where canopy cover is <40%. Recent research using GPS-marked owls on the Plumas National Forest indicated that owls selected for canopy cover >70%, used 50-70% canopy cover in proportion to availability, and selected against <50% canopy cover for both foraging and roosting (Blakey et al. 2019a).

All research shows they use large, old trees and snags as structures for nest and roost sites, embedded in a forest stand that has complex structure (Blakesley et al. 2005, Gutiérrez et al. 1992, Verner et al. 1992). Average nest tree is 49 in DBH and 103 ft tall with an average nest height of 74 ft (Gutiérrez et al. 1992, Roberts et al. 2011).

California spotted owl habitat is currently managed through the establishment of Protected Activity Centers (PACs) and Home Range Core Areas (HRCAs). The total acres designated in a PAC and HRCA on the Plumas National Forest are approximately 1,000 acres, comprised of the 300-acre PAC and 700 acres of the best available habitat around or adjacent to the PAC. Spotted owl PACs and HRCAs are established for activity centers based on criteria described in the SNFPA FEIS ROD (USDA 2004). Blakey et al (2019a) found that while spotted owls selected for PACs while foraging and roosting based on availability on the landscape, PACs protected less than one quarter of foraging space use and fewer than half of observed roosts during the breeding season. Maintaining suitable habitat conditions outside of PACs in the HRCAs and general forest, as well as maintaining habitat connectivity across the landscape is likely an important component for spotted owl viability.

The California spotted owl is continuously distributed on the western slope of the Sierra, with fewer detections on the drier, east side of the range (Verner et al. 1992). Eastside pine habitat is technically considered suitable for nesting and foraging, however, Verner et al. (1992) documented only 0.5% of California spotted owl sites throughout their range to occur in eastside pine type habitat. The Mapes Crocker project is at the apparent eastern limit of spotted owl occupancy on the Plumas National Forest. Suitable habitat within the Mapes Crocker project is comprised primarily of eastside pine type habitat with only a small amount of Sierran mixed conifer type habitat. Approximately 37% of the Wildlife Analysis Area constitutes suitable spotted owl habitat, primarily lower quality foraging habitat (CWHR 4M) with suitable nesting habitat making up approximately 9% of the Wildlife Analysis Area (Table 4).

Table 4. Acres of Suitable* California Spotted Owl Foraging and Nesting Habitat on National Forest System lands within Wildlife Analysis Area and Project Treatment Units

CWHR Type	Habitat Type	Analysis Area (acres)	All Treatment Units (acres)	Mechanical Thinning Units (acres)	Habitat Type	Change in Habitat (acres)	Habitat Treated (percent)
4M	Foraging	3,559	1,540	1,120	EPN	-1,120	2,439 (69%)
				104	SMC		
4D	Foraging	851	468	348	EPN	-348	503 (59%)
				13	SMC		
Total Foraging		4,410	2,008	1,585		1,468	2,942 (67%)
5M	Nesting	1,083	514	295	EPN	-295	788 (73%)
				107	SMC		
5D	Nesting	397	225	166	EPN	-166	231 (58%)
				9	SMC		
Total Nesting		1,480	739	577		-461	1,019 (69%)
Grand Total		**5,890**	**2,748**	**2,162**		**-1,929**	**3,961 (67%)**

*** Suitable habitat includes Eastside Pine, Montane Hardwood-Conifer, Montane Hardwood, Red Fir, Sierran Mixed Conifer and White Fir. EPN indicates eastside pine type habitat including ponderosa pine and Jeffery pine stands. SMC indicates Sierran mixed conifer type habitat including other non-pine dominated stands. Acres burned at >50% basal area mortality in the Dixie fire were not included in counts of suitable habitat.**

Analysis Area Surveys

There are currently no designated PACs or HRCAs within the project area or analysis area. Suitable habitat within the analysis area was surveyed in 2021, with a second year of surveys planned to occur in 2022 following the two-year protocol standard (*Protocol for Surveying for Spotted Owls in Proposed Management Activity Areas and Habitat Conservation Areas*, 1991, revised 1993). No spotted owls were detected as a result of project-specific surveys.

There have been two prior observations of spotted owls in the project area, one in 2005 and one in 2007, neither of which were relocated during follow-up efforts (NRIS database accessed January 2021).

Environmental Consequences – California Spotted Owl

Alternative A – Proposed Action

Direct effects to spotted owls are unlikely given the apparent lack of species occurrence in the project area. If spotted owls are found to occupy the project area during the life of the project, a Protected Activity Center would be designated and a Limited Operating Period (LOP) would be implemented from March 1 to August 15 within 0.25 mile of an active nest.

Vegetation Treatments

Mechanical Thinning, Mechanical Fuels Treatments

Within the Mapes Crocker Project area, the proposed action would result in a reduction in quantity of habitat currently classified as suitable for foraging and nesting.; dense canopy cover would be reduced within the eastside pine type units to below the minimum threshold of suitability. Treatments within Sierran mixed conifer stands would retain suitable habitat at 40% canopy cover. Additionally, treatments are expected to move conditions toward larger tree size classes, which could be beneficial to

potential foraging and nesting habitat in the future. Treatments are also expected to provide long-term benefits to spotted owl habitat by increasing the resiliency of the landscape and reducing the risk of habitat loss due to insects, disease, and wildfire.

Aspen Stand Improvement, Spring Improvement, Meadow Improvement Treatments

Removal of encroaching conifers from aspen stands and springs would have additional impacts to the reduction of spotted owl suitable habitat. All conifers, including trees over 30 inches DBH, may be removed from within 150 feet of aspen stands and 100 feet of springs. These treatments would remove spotted owl habitat, but would be beneficial to the landscape and habitats that may be important for prey species.

Removal of conifers encroaching on meadow systems is not expected to impact the suitability of any spotted owl habitat. The removal of conifers from meadows would promote healthy growth of meadow vegetation, and improve the current conditions of the meadow systems, which may be an important habitat type for prey species. Therefore, meadow treatments are expected to be beneficial to spotted owls.

Hand Thinning

Hand thinning treatments would simplify the understory by removing ladder fuels and small diameter trees, which could have a negative impact on spotted owl habitat as they prefer habitat with a multi-layered canopy and a complex understory. However, overstory canopy coverage would generally not be impacted by the removal of small diameter trees and treatments are expected to provide long-term benefits to spotted owl habitat by increasing the resiliency of the landscape and reducing the risk of habitat loss due to insects, disease, and wildfire.

Prescribed fire

Prescribed fire could occur in suitable habitat as follow-up to thinning treatments within the project area. Due to logistical constraints, it is likely that many units would not receive prescribed fire following other treatments, however, there is the potential to burn these units if the opportunity arises.

Prescribed fire is expected to have minimal to beneficial impacts to spotted owl habitat. Prescribed burns would consume logs and snags within units that provide potentially suitable habitat. However, snags and downed logs would likely be recruited through the prescribed burning process so both the short- and long-term effects would be negligible. Research suggests that spotted owls are not adversely affected by low- to moderate-severity fire (Roberts et al. 2011, Lee et al. 2013), and will select burned areas of all severities over unburned areas for foraging, and will select low-intensity burned areas for roosting (Bond et al. 2009). Prescribed burning would contribute to lower fire risk in both the short- and long-term, and may be beneficial in creating desirable habitat conditions for spotted owl prey species. Increased fire-resiliency would also protect habitat from potential stand replacing fire that could eliminate PACs from the adjacent landscape.

Road Treatments

Temporary road construction could cause increased fragmentation of the habitat, especially if overstory trees are removed to create the roads. Duration of impacts from temporary road construction would depend on the degree of habitat fragmentation caused by temporary road construction. These roads would be decommissioned when no longer needed for the project. Vegetation would establish post-project and may partially ameliorate the effects of habitat fragmentation from road construction by providing potential habitat for prey species. Actions to remove existing roads, including road obliterations and seeding with native vegetation, would have a positive effect on spotted owl habitat by facilitating vegetation recovery and lessening fragmentation of the habitat. Reducing open road densities would have a positive effect, by reducing human activities that often cause disturbance and reduce habitat suitability for many species, including spotted owls.

Cumulative Effects

General cumulative effects specific to the project area are listed under General Environmental Consequences (see above). These uses are expected to continue.

Climate change has the potential to negatively impact spotted owls and their habitat. While the exact effects are difficult to anticipate, some general effects may be described for the range and habitat types of many Sierran habitats (Safford 2006). Fires are expected to become more frequent and more intense (Cayan et al 2006; Battles et al 2006; Mallek et al 2013). Higher fire activity will adversely affect important habitat components such as large tree densities and canopy cover. Fires also increase snag and surface woody debris in the short term (5-20 years), but increased frequencies of fire ultimately reduce these important habitat components over the long term because large trees are not available to recruit new snags and logs over time. In addition, productivity of conifers in a warmer climate, particularly pines, would be greatly reduced, slowing recovery of forest habitats.

During 2019-2021, wildfire burned through approximately 830,000 acres (58%) of Plumas National Forest lands. While the amount of area affected by fire within the analysis area is relatively small (approximately 9%), the larger impact to the landscape and loss of late seral dense canopy cover habitat may add to effects from project activities. Spotted owls displaced by fire seeking refugia in the Mapes Crocker Project Area could be further impacted by project activities and cause effects to a degree not expected based on project activities alone; previously unoccupied habitat may become occupied as the amount of suitable habitat available throughout Plumas National Forest has significantly decreased due to recent wildfires.

Alternative B – No Action

Under Alternative B there would be no reduction in risk of high severity fire in suitable spotted owl habitat. Current conditions contributing to risk of high severity fire would continue to progress. High severity fire originating within the project area could spread to adjacent areas with higher quality habitat and adversely affect the continued existence of suitable spotted owl habitat on the landscape.

Determinations - California Spotted Owl

The proposed action (Alternative A) for the Mapes Crocker Project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the California spotted owl. This determination is based on the following:

- Existing conditions within the wildlife analysis area do not currently support spotted owl breeding and appear to only minimally support spotted owl foraging.
- Improved forest resiliency would help maintain habitat on the landscape by reducing the risk of stand replacing events due to high severity wildfire which could spread to adjacent areas with high quality spotted owl habitat.
- Improved timber stand conditions would create healthier stands that would mature into higher quality spotted owl habitat than is currently present in the project area.

The no action alternative (Alternative B) would not affect California spotted owls. However, failure to reduce the risk of high severity fire could result in the future loss of habitat due to stand-replacing high severity fire.

Greater Sandhill Crane (*Antigone canadensis tabida)*

Existing Condition

Population Status

Greater sandhill cranes are a state threatened, and a Forest Service sensitive species. Locally, greater sandhill cranes breed in northeastern portions of California and extreme western Nevada, and winter in the Central Valley of California where they are joined by other subspecies of Sandhill Crane (Grinnell and Miller 1944, Tacha et al. 1992, Littlefield et al. 1994, Small 1994, Floyd et al. 2007, Littlefield 2008).

Both breeding and wintering Greater Sandhill Cranes are considered locally rare to uncommon in appropriate habitats throughout California and western Nevada (Grinnell and Miller 1944, Garrett and Dunn 1981, Small 1994, Fix and Bezener 2000, Floyd et al. 2007). The breeding population in California was censused at only 276 pairs in 1986. Winter status of breeding populations is confused by influx of the more common Lesser sandhill cranes from breeding populations in the Arctic, but the population of greater sandhill cranes was estimated at 5-7,000 individuals in the late 1980s (Pogson and Lindstedt 1991). Sandhill Crane populations in California and the western United States are reported to be increasing (Pogson and Lindstedt 1991, Tacha et al. 1992), but trends are based on winter populations that include Lesser Sandhill Cranes (Tacha et al. 1992).

Habitat Requirements

Greater sandhill cranes breed in open wetland habitats surrounded by shrubs or trees. They nest in marshes, bogs, wet meadows, prairies, burned-over aspen stands, and other moist habitats, preferring those with standing water. Breeders gravitate toward the edges between wetland and upland habitats, while nonbreeders may prefer open, grassy sites. An omnivorous species, cranes feed on grasses, forbs, roots, tubers, seeds, grains, earthworms, and insects. Larger prey, such as mice, small birds, snakes, frogs, and crayfish are also taken (Eckert and Karalus 1981, Terres 1980).

There are several meadows throughout the Mapes Crocker analysis area ranging from large meadow complexes to small stringer meadows. Meadow conditions are variable, ranging from wet to dry. The exact acreage of suitable nesting habitat within the project area has not been quantified.

Analysis Area Surveys

No formal surveys were conducted for sandhill cranes; no records of breeding sandhill cranes occur in the Mapes Crocker analysis area in the Forest Service NRIS database. However, there are multiple observations of sandhill cranes in both the Forest Service NRIS database as well as on the Cornell Lab of Ornithology eBird website (both accessed December 2021).

Environmental Consequences – Greater Sandhill Crane

Alternative A – Proposed Action

Vegetation Treatments

Mechanical Thinning and Mechanical Fuels Treatments

Direct effects due to mechanical treatment are not anticipated because the species is not expected to occur in forested areas. Mechanical treatments could potentially cause disturbance to individuals or disrupt breeding activities should cranes decide to breed in or adjacent to these areas. The potential for direct mortality due to mechanical thinning activities is negligible given the low probability of cranes being in forested stands where mechanical thinning would occur, as it is generally found in meadows and other open habitats.

Aspen Stand Improvement

Aspen stands can occur in association with meadow habitat that could provide suitable nesting habitat for sandhill cranes. Thinning activities for aspen improvement may disturb individuals and disrupt breeding activities. Given the mobility of adults, activities are unlikely to result in direct mortality of adults; juvenile mortality could occur if activities cause disturbance that results in nest abandonment. Should nesting be discovered prior to project activities, appropriate measures would be taken to avoid impacts to breeding cranes.

Meadow Improvement

Removing conifers within meadows and thinning around meadows could negatively affect greater sandhill cranes directly and indirectly in the short term, but will positively affect the species in the long term. Mechanical thinning in meadow buffer areas could potentially cause disturbance to individuals or disrupt breeding activities should cranes decide to breed in the project area. The potential for direct mortality due to mechanical thinning activities is negligible given the mobility of adults and the low probability of cranes being in forested stands where mechanical thinning would occur. Hand-thinning within the meadow may disturb individuals and disrupt breeding activities. Meadows planned for treatment will be checked prior to implementation for the presence of sandhill cranes. Should nesting be discovered prior to project activities, a limited operating period (LOP) would restrict activities within the meadow April 1 – August 1.

Removal of encroaching conifers within the meadow and thinning of trees within the meadow boundary are expected to have a beneficial effect on sandhill crane habitat. Conifers have the potential to dewater meadows and lower the water table allowing for accelerated encroachment of other conifers and upland shrubs, altering the habitat. Removal of conifers will allow for the expansion of meadow and riparian vegetation and preserve and enhance meadow health and function. Overall, meadow improvement treatments would be beneficial to sandhill crane habitat.

Spring Improvement

Direct and indirect effects would be similar to those for aspen stand improvement, described above.

Hand Thinning

Direct effects due to hand thinning are not anticipated because the species is not expected to occur in forested areas, as it is generally found in meadows and other open habitats. Indirect effects could occur due to noise and increased activity in the area.

Prescribed Fire

Direct effects due to prescribed fire are not expected. Sandhill cranes typically nest in wet areas not conducive to burning. Additionally, prescribed fire in meadow habitat is typically implemented in the fall, after the nesting period, when vegetation is drier and more conducive to burning. Indirect effects could occur if spring burning is implemented in forested stands adjacent to meadows used for breeding, however, impacts due to smoke and increased human presence are expected to be negligible.

Road Treatments

Most road maintenance activities will have no effect on greater sandhill cranes. There is some potential for noise disturbance, however effects are anticipated to be of short duration.

Cumulative Effects

There are no known cumulative effects beyond those listed under General Environmental Consequences (see above). These uses are expected to continue. The true extent and effect of these activities on greater sandhill cranes is not known.

Alternative B – No Action

There would be no direct effects to greater sandhill cranes or their habitat, as no activities would occur that would cause disturbance to nesting, nor any impacts to the existing habitat conditions. However, no action would result in further encroachment of conifers in meadows and further degradation of suitable meadow habitat within the project area.

Determinations – Greater sandhill crane

The proposed action (Alternative A) for the Mapes Crocker Project may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for the greater sandhill crane.

The no action alternative (Alternative B) would not affect greater sandhill cranes.

Northern Goshawk (*Accipiter gentilis*)

Existing Condition

Population Status

A total of 588 northern goshawk-breeding territories have been reported from Sierra Nevada National Forests. As of May 2020, the Plumas NF corporate GIS coverage included 186 goshawk PACs. These numbers represent goshawks that have been found as a result of both individual project inventories to standardized protocols, as well as nest locations found by other incidental methods (general stand searches, nests found by other employees in the course of their work).

The PNF LRMP EIS (USDA 1988) stated that the Plumas has the capacity for 100 goshawk pairs. The 1988 PNF LRMP calls for a network of 60 nesting territories to provide for the viability of the goshawk. It is uncertain as to whether this figure is accurate. The Forest began delineating goshawk territories prior to implementation of SNFPA, and currently establishes 200-acre PACs for all newly discovered goshawk breeding sites (USDA 2004). The current number of 186 PACs exceeds the minimum objectives by more than double, and the predicted capacity of 100 PACs. However, it should be noted that it is unknown how many of these PAC's are actually occupied by goshawks. PACs are maintained regardless of occupancy status. Actual number of goshawks on the Plumas is unknown.

Population trends of northern goshawks in the Sierra Nevada are unknown, although numbers are suspected to be declining due to habitat reductions and loss of territories to timber harvest (Bloom et al. 1986). Based on several studies (Bloom et al., 1986, Reynolds et al. 1994, Kennedy 1997, Squires and Reynolds 1997, Smallwood 1998, DeStefano 1998) there is concern that goshawk populations and reproduction may be declining in North America and California due to changes in the amount and distribution of habitat or reductions in habitat quality. Monitoring of nest sites on the Mt. Hough Ranger District of the PNF from 1998 to 2002 indicates that over 5 years nesting activity occurred at approximately 36% of monitored sites annually (Natural Resources Information System (NRIS) wildlife database). From 2004-2007, the mean number of offspring produced during 62 nesting attempts on the PNF ranged between 1.1-1.9 offspring/nest (Dunk et al. 2011). Considered as a whole, these data indicate that the goshawk population on the PNF appears relatively stable.

Habitat Requirements

Northern goshawks are currently being managed under the PNF LRMP guidelines as amended by the SNFPA FSEIS ROD (USDA 2004). Habitat requirements for this species can be found within the SNFPA FEIS and summarized below.

Northern goshawks require mature conifer and deciduous forest with large trees, snags, downed logs and dense canopy cover for nesting, and appear to prefer more open habitats for foraging (forests with moderately open overstory, open understory interspersed with meadows, brush patches, other natural or artificial openings and riparian areas). Mature coniferous, mixed, and deciduous forest habitats provide large trees for nesting, a closed canopy for protection and thermal cover, and open spaces allowing maneuverability below the canopy (Fowler 1988). Research indicates that goshawks typically select canopy covers greater than 60% for nesting (Hall 1984, Richter and Calls 1996, Keane 1997). In northern and northwestern California, canopy closure has been found to be 77-94% on average (range = 53-100%) at the nest site (Saunders 1982, Hall 1984). Estimates of percent canopy cover in nest sites on the east side of the Sierra Nevada and in the lodgepole pine stands in eastern Oregon have been found to be lower. Canopy closure at 11 nests on the Inyo National Forest ranged from 27-63% (McCarthy 1986). In eastern Oregon, nests in mature lodgepole stands (4%) were characterized by single-layered canopies with an average closure of 38%; however, most of the nest sites in eastern Oregon were found in dense mature conifer stands with a mean canopy closure of 60% (Reynolds et al. 1982).

PACs are designated based on guidelines provided in the SNFPA FSEIS 2004 ROD and are delineated around known and suspected nest stands to include the best available habitat in relationship to geographical features and stand continuity based on aerial imagery and GIS evaluations of CWHR types. Where there is insufficient suitable habitat (6, 5D, 5M, 4D and 4M), to meet the 200-acre guideline for a PAC, the next best vegetation sizes and types available are included. A recent study on the Plumas NF (Blakey et al. 2020) found that only 25% of goshawk use occurred in goshawk PACs and 75% of use occurred in stands outside of PACs. Blakey et al (2020) also found majority of use occurred in stands with greater than 50% canopy cover and with dominant trees greater than 50 cm DBH (20”).

Based on the vegetation layer and the CWHR model, approximately 8,993 acres or 56% of the Wildlife Analysis Area may be considered suitable habitat for goshawks, including 5,890 acres (37%) suitable for nesting (CWHR 4M, 4D, 5M, 5D), and an additional 3,103 acres (19%) suitable for foraging (CWHR 3M, 3D, 4P, 5P) (Table 5. Approximately 76% of all suitable goshawk habitat (nesting and foraging) in the Mapes Crocker Project analysis area is mid-seral (CWHR size class 4, 11-23.9 inches DBH), with late seral (size class 5, 24+ inches DBH) accounting for only 10% of all suitable habitat and 25% of suitable nesting habitat.

Table 5. Acres of Suitable Northern Goshawk Foraging and Nesting Habitat on National Forest System Lands within Wildlife Analysis Area

CWHR Type	Habitat Type	Analysis Area (acres)*	All Treatment Units (acres)	Mechanical Thinning Units	Habitat Type	Change in Habitat (acres)	Post-Treatment (acres)
3M	Foraging	245	84	28	All	-28	217 (89%)
3D	Foraging	302	116	29	All	-29	273 (90%)
4P	Foraging	2,454	891	710	All	+758	1,744 (71%)
5P	Foraging	102	27	1	All	+461	101 (99%)
Total Foraging		3,103	1,118	768	All	+1,162	2,335 (75%)
4M	Nesting	3,559	1,540	1,120	EPN	-1,120	2,439 (69%)
				104	SMC		
4D	Nesting	851	468	348	EPN	-348	503 (59%)
				13	SMC		
5M	Nesting	1,083	514	295	EPN	-295	788 (73%)
				107	SMC		

CWHR Type	Habitat Type	Analysis Area (acres)*	All Treatment Units (acres)	Mechanical Thinning Units	Habitat Type	Change in Habitat (acres)	Post-Treatment (acres)
5D	Nesting	397	225	166	EPN	-166	231 (58%)
				9	SMC		
Total Nesting		5,890	2,748	2,162	All	-1,929	3,961 (67%)
Grand Total		**8,993**	**3,866**	**2,930**		**-767**	**6,296 (70%)**

***Acres burned at greater than 50% basal area mortality in the Dixie fire were not included in counts of suitable habitat. EPN = eastside pine, SMC = Sierran mixed conifer; treatments in SMC nesting habitat would retain at least 40% canopy cover.**

Analysis Area Surveys

There are two northern goshawk protected activity centers within the Mapes Crocker project Wildlife Analysis Area (Figure 3 Table 6). Northern goshawk surveys were conducted within the wildlife analysis area during 2018-2019 by Forest Service personnel and the Institute for Bird Populations. No goshawks were detected during project-specific surveys. The two goshawk PACs in the analysis area have not been active since the late 1990s, although little survey data exists between the late 1990s and recent project specific surveys.

Table 6. Northern goshawk Protected Activity Centers within the Mapes Crocker Project wildlife analysis area.

Site Number	Site Name	Years Surveyed	Known years with nesting NOGO
R05F11AD01T05	Crocker	1982-1985, 1987, 1988, 1990-1992, 1994-1996, 1998, 2018, 2019	1979, 1982, 1985 1992, 1996, 1998
R05F11AD01T06	Davis	1979-1986, 1989-1992, 1994-1996, 1998, 2007, 2008, 2018, 2019	1979, 1980, 1981, 1989, 1990, 1991, 1992, 1994, 1996, 1998

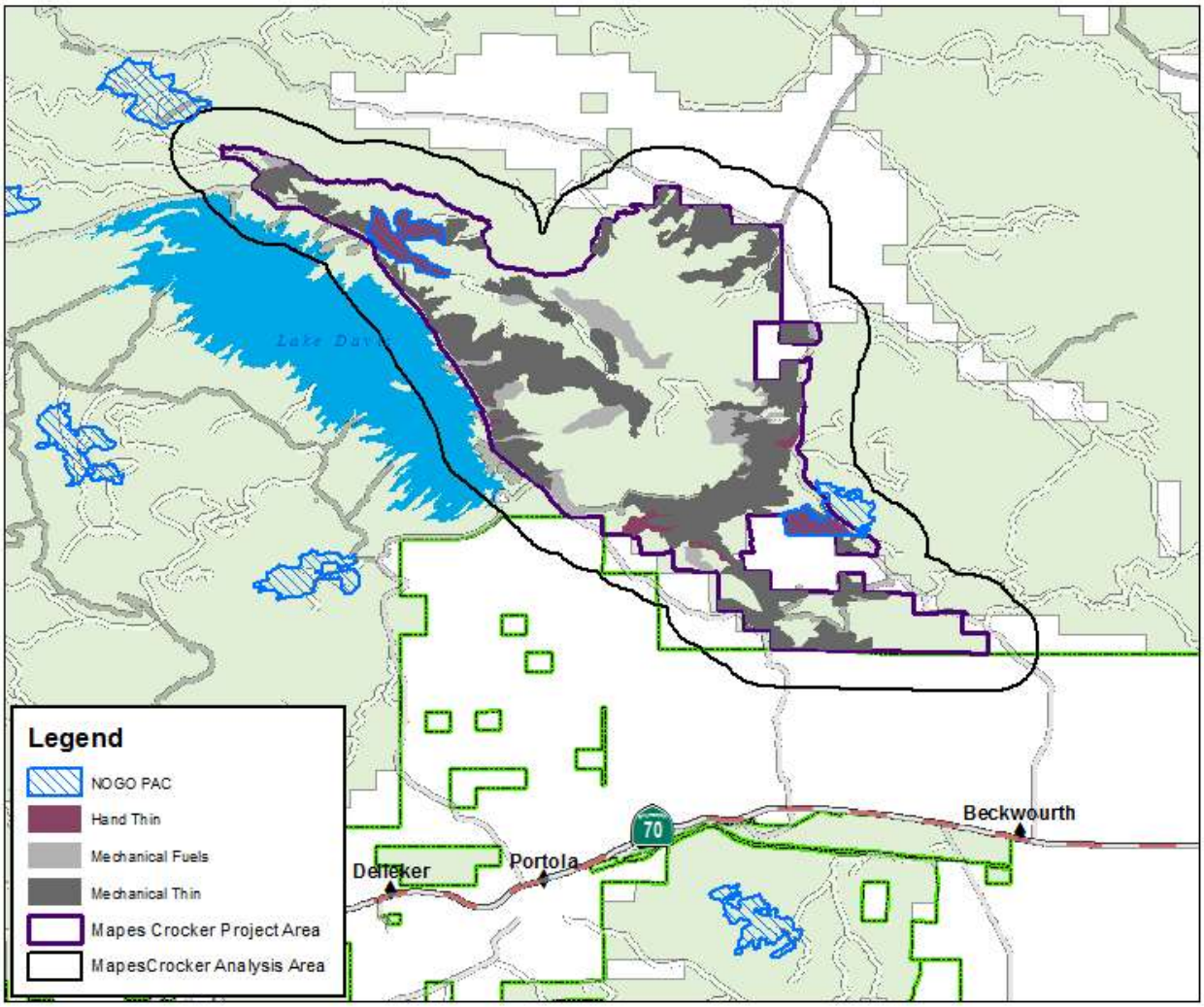

Figure 3. Northern goshawk protected activity centers (PACs) in the Mapes Crocker Project wildlife analysis area, including treatment units.

Environmental Consequences – Northern Goshawk

Alternative A – Proposed Action

The Mapes Crocker Project proposes to treat 46% (2,748 acres) of suitable goshawk nesting habitat within the analysis area (Table 5). Treatments consist of mechanical thinning (2,162 acres), mechanical fuels (426 acres), hand-thinning (342 acres), as well as prescribed fire as a follow-up to other treatments. Dense canopy cover would be reduced within the units but would maintain the largest trees within treated stands and across the landscape.

Potential negative effects to goshawks may result from the modification or loss of habitat or habitat components, and rarely from direct mortality. No removal of known nest trees would occur under the Proposed Action. Disturbance associated with logging, temporary road construction, or other associated activities within or adjacent to occupied habitat may disrupt nesting, fledging, and foraging activities (Richardson and Miller 1997). A limited operating period (LOP) would be implemented from February 15

to September 15 within 0.25 mile of an active nest, if a recent nest site is unknown surveys will be conducted prior to treatments within PACs. No heavy equipment operations or tree felling would be allowed during the LOP.

Vegetation Treatments

Mechanical Thinning

Under the proposed action mechanical thinning would occur on approximately 2,930 acres (33%) of suitable goshawk habitat (nesting and foraging) within the wildlife analysis area. Mechanical thinning treatments in eastside pine have the potential to reduce nesting habitat in the analysis area by 1,929 acres (33%) and convert it to foraging habitat. Further, mechanical thinning could render 461 acres (31%) of the highest quality nesting habitat (5M and 5D, see Blakey et al. 2020) unsuitable for nesting.

Standards and guidelines from the SNFPA FSEIS ROD (USDA 2004) direct that within Sierran mixed conifer type habitat suitable for goshawk nesting, thinning treatments will not reduce canopy cover below 40%; however, there is no canopy cover restriction for eastside pine habitat. Therefore, in Sierran mixed conifer stands, mechanical thinning within suitable nesting habitat would result in the reduction of canopy cover, but habitat would maintain suitability. In eastside pine type stands, canopy cover in nesting habitat could be reduced to below the minimum threshold of suitability and converted to conditions within the suitable range for foraging habitat. Based on Forest Vegetation Simulator modeling, currently suitable nesting habitat that is converted to foraging habitat generally would not recover to being suitable for nesting within the 40-year time span modeled. While this change could have a negative impact on nesting opportunities for goshawks within the project area, 67% of suitable nesting habitat will be retained and treatments would maintain and enhance foraging habitat in the project area. Treatments in eastside pine are anticipated to move tree size class from 4 to size class 5 over approximately 20 years post-implementation, which could be beneficial to developing higher quality goshawk habitat.

Variable density thinning will be implemented to provide structural complexity through a mosaic of treated and untreated areas throughout each treatment unit, enhancing heterogeneity that may be important to goshawks and their prey. Bosakowski (1999) noted one study that recommended thinning with variable spacing to provide spatial heterogeneity characteristics of old-growth. In addition, goshawk productivity is closely associated with prey species abundance. Richer prey communities allow goshawks to exploit alternate prey species when preferred prey items are scarce (Salafsky, et al, 2007). An abundant and diverse prey base is reduced when forest composition and structure limit the prey species habitat or accessibility to prey by the goshawks. Thinning dense stands would enhance foraging habitat, providing enhanced growth of understory shrubs and forbs allowing for a greater diversity of prey species.

While mechanical thinning treatments will result in negative effects to goshawk nesting habitat, they are anticipated to have some long-term beneficial effects. Treatments would move stands toward a density, arrangement, and species composition more similar to pre-European settlement conditions which were created by a high-frequency, low-intensity fire regime, that the landscape may be better able support into the future (Miller and Safford 2017). Under a natural low-severity, high-frequency fire regime, the typically more xeric, southwest-facing and ridgetop sites would have been dominated by larger diameter pine species in open canopy conditions. Northeast-facing aspects and riparian areas in canyon/drainage bottoms, being more mesic and less prone to fire, would have contained higher densities of trees with a larger component of shade-tolerant tree species (North et al. 2009). There are also potential long-term benefits to goshawk habitat if proposed treatments should reduce the risk of future high severity wildfire passing through this landscape. Increased fire-resiliency would protect habitat from potential stand-replacing fire that could eliminate PACs and suitable habitat from the

landscape. Improved forest health would create stands that would mature into higher quality goshawk habitat than is currently present in the project area, although it is unknown if nesting habitat that is converted to foraging habitat would recover to being suitable nesting habitat.

Mechanical Fuels Treatments

Mechanical fuels treatments are planned in 569 acres of suitable goshawk habitat (339 acres of nesting and 230 acres of foraging). Treatments would result in a reduction of understory complexity, which could be beneficial to goshawk habitat. Treatments would be designed to maintain a mosaic of brush clumps, which could be beneficial to goshawk prey species. However, there is some uncertainty with mechanical fuels treatments as mastication can create surface fuels that can persist for many years and contribute to increased rates of fire spread and residual tree mortality during wildfire events (Reed et al. 2020, Safford at al. 2012, Stephens and Moghaddas 2005).

Aspen Stand Improvement

Direct and indirect effects include disturbance associated with project activities as described above. Aspen stand improvements could result in the modification or removal of localized areas of suitable habitat. Within 150 feet of aspen stands, all conifers may be removed, including those greater than 30 inches DBH. Removal of conifers would result in open canopy conditions not considered suitable for goshawk habitat and may create a hard edge, the effect of which on goshawk behavior is uncertain (Greenwald et al. 2005, Reynolds et al. 2007). However, these openings would be spatially limited to areas directly adjacent to aspen stands. Approximately 268 acres of aspen improvement treatments have been identified within the project area. The 150-foot treatment buffer on these known stands overlap with approximately 77 acres of suitable coniferous nesting habitat for goshawks that would be removed and converted to open/early seral conditions as a result of removing all trees, including those over 30" DBH, within the buffer. Additional aspen stands may be identified for treatment during project implementation layout (up to an additional 132 acres of aspen improvement treatments within other treatment units). It is possible all additional aspen treatment acres identified during project layout would result in added impact to goshawk habitat through clearing of all conifers, including large trees, from the 150-foot buffer around aspen. To reduce negative impacts of removing large trees adjacent to goshawk territories, aspen treatments within ¼ mile of a PAC would be evaluated by the district silviculturist and district biologist to develop a site-specific prescription for removal of trees greater than 30 inches DBH.

Improving aspen stands is expected to have some beneficial effects to goshawks and their prey. Aspen stands are centers of biodiversity on the landscape, typically supporting a higher diversity and species richness of plants and animals than surrounding habitat types (Rogers 2017, Earnst et al. 2012, Kuhn et al. 2011). Aspen stands attract a diverse array of prey species, thereby providing high quality foraging habitat for goshawks. Aspen is important habitat for woodpeckers, which are a common prey item for goshawks. Mature aspen stands are considered suitable habitat for goshawk nesting. Aspen stands within the project are at risk of decline due to encroaching conifers in the absence of fire. Long term benefits of improving aspen stands and ensuring the habitat type is retained on the landscape are expected to outweigh the loss of coniferous habitat directly adjacent to the aspen.

Meadow Improvement

Direct and indirect effects include disturbance associated with project activities as described above. Removing conifers from within meadows would not have any effect on goshawk habitat, and may be beneficial to some goshawk prey species. Thinning of conifers around meadow edges could reduce the quality or quantity of suitable nesting habitat directly adjacent to meadow, but the benefits of improved meadows are expected to outweigh the localized impacts to goshawk nesting habitat. No known nest trees would be cut.

Spring Improvement

Conifers, including those over 30 inches DBH could be removed from within 100 feet of special aquatic features such as springs. Water is a limited resource on the generally dry landscape in the Mapes Crocker project. Improving springs by removing encroaching conifers is expected to be overall beneficial to goshawks and their prey.

Hand Thinning

Hand thinning is planned for 342 acres of suitable habitat, including 306 acres within northern goshawk protected activity centers (PACs). Approximately 101 acres of hand thinning within the Crocker PAC may include thinning of trees up to 11 inches DBH to meet fuels objectives within the wildland urban interface (WUI); treatments would be designed by the district silviculturist in coordination with the district wildlife biologist to retain suitable habitat and key habitat components. Treatments in the PAC outside the WUI would be limited to thinning of trees no greater than 6 inches DBH. Northern goshawks prefer high canopy cover with open understory. Hand thinning could be beneficial to goshawks through removal of small diameter trees, which would create more open understory conditions while leaving the overstory unchanged. Goshawk habitat would also benefit from increased resiliency to high severity fire, insects and disease. Noise disturbance associated with human presence and chainsaw use may disrupt nesting, fledging, and foraging activities. Implementation of LOPs would reduce any potentially disturbing effects associated with project activities.

Prescribed Fire

Prescribed fire could occur within all treatment units as a follow-up to thinning or mechanical fuels treatments. Due to logistical constraints, it is likely that many units would not receive prescribed burning following other treatments, however, there is the potential to burn these units if the opportunity arises.

Prescribed burns are conducted at low to moderate intensity and are therefore not expected to impact the suitability of goshawk habitat. Reintroducing fire to the ecosystem would be beneficial to goshawk habitat by increasing resistance to high-severity wildfire. Disturbance due to smoke, and noise related to activities such as line construction adjacent to occupied habitat may disrupt nesting, fledging, and foraging activities. Implementation of seasonal LOPs around activity centers would offset any potentially disturbing effects associated with prescribed fire activities during the breeding season.

Road Treatments

Actions to remove existing roads, including road obliterations and seeding with native vegetation, would have a positive effect on goshawks by facilitating vegetation recovery and lessening fragmentation of the habitat. Reducing open road densities would have a positive effect, reducing disturbance and human activities that often reduce habitat suitability for many species, including goshawks.

Cumulative Effects

General cumulative effects specific to the project area are listed under General Environmental Consequences (see above). These uses are expected to continue. The true extent and effect of these activities on the northern goshawk is not known.

Overall past, present, and reasonably foreseeable future projects on forest land would cumulatively maintain suitable habitat by limiting treatments in PACs, reducing fuels accumulations, increasing resilience while limiting canopy cover reduction in the highest quality habitat, and retaining snags and logs where available in surrounding conifer forest.

Additional cumulative effects due to climate change would be similar to those described for spotted owls (see above). During 2019 and 2021, wildfire burned through approximately 830,000 acres (58%) of Plumas National Forest lands. While the amount of area affected by fire within the analysis area is relatively small (approximately 9%), the larger impact to the landscape and loss of late seral dense

canopy cover habitat may add to effects from project activities. Goshawks displaced by fire seeking refugia in the Mapes Crocker Project Area could be further impacted by project activities and cause effects to a degree not expected based on project activities alone; previously unoccupied habitat may become occupied as the amount of suitable habitat available throughout Plumas National Forest has significantly decreased due to recent wildfires.

Alternative B – No Action

There would be no direct effects on goshawks due to the no action alternative because none of the proposed activities would occur. The indirect effects of no action would include an increased risk for future wildfire and related impacts on habitat development and recovery. Current conditions contributing to risk of high-severity fire would incrementally increase over time and potential wildfires in the area would continue to become more difficult to suppress. Stand replacing wildfires in the future would likely eliminate northern goshawk habitat from the analysis area in the long-term.

Due to past logging methods that focused on removing the largest trees in combination with a century of fire suppression, stands are currently at risk of high-severity, stand-replacing fire that was not characteristic of pre-settlement conditions. High severity fire has the potential to drastically and severely impact the availability of suitable goshawk habitat, as is demonstrated by recent wildfires including the Dixie Fire a 963,309 acre fire which burned on Plumas and Lassen National Forests in 2021. Late seral habitat that burns at stand-replacing high-severity may take 150 years or more to recover, or may never recover due to changing climate conditions which may limit the ability of stands to become reestablished.

Determinations - Northern Goshawk

The proposed action (Alternative A) for the Mapes Crocker Project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for the northern goshawk. This determination is based on the following:

- 67% of suitable nesting habitat would be retained within treatment units.
- Important habitat attributes would be retained (large trees, snags, course woody debris).
- Limited operating periods would reduce disturbance to nesting activity.
- Improved forest health would create stands of larger trees that are more resilient to wildfire, insects and disease.
- Improving aspen, springs, and meadows, as well as reducing the risk of high severity fire would have long-term benefits to goshawks and their habitat.

It is acknowledged that implementation of the Proposed Action involves some risk to habitat and subsequent uncertainty with regards to goshawk activity. These impacts are not expected to significantly affect the viability of the species throughout the Sierra Nevada range or the Plumas National Forest as a whole, and project treatments are expected to increase resiliency of the landscape and remaining goshawk habitat.

The no action alternative (Alternative B) would not affect northern goshawks. There would be no reduction in the quantity or quality of habitat in the short-term; existing suitable goshawk habitat would remain suitable. However, failure to reduce the risk of high severity fire could result in the future loss of habitat due to stand-replacing high severity fire.

Willow flycatcher (*Empidonax trailii brewsteri*)

Existing Condition

Population Status

In California, the populations of willow flycatchers declined within the last century. In the 1920s, the willow flycatcher was never abundant, but it was commonly found in riparian (riverine) or wet meadows. In the 1980s, surveyors found fewer sites with willow flycatchers than had been recorded previously. Some of the population declines was due to loss of wet marshes, wet meadows, and riparian (riverine) vegetation that occurred in the first half of the 1900s.

In the Sierra Nevada, willow flycatcher occurrence is both sparse and patchy (Bombay et al. 2003). Throughout the Sierra Nevada, loss and degradation of riparian and meadow habitats due to anthropogenic factors is a likely contributing factor to population declines of breeding willow flycatchers (Siegel and DeSante 1999, Green et al. 2003, RHJV 2004, RHJV 2007). Aside from degraded habitats, however, willow flycatchers are also absent from much seemingly appropriate habitat, including areas where the species occurred in the early 20th Century (Siegel et al. 2008). Recent efforts to conserve and manage riparian habitats in California could help populations in California overall, although this does not yet appear to be leading to an immediate recovery of Sierra populations (Green et al. 2003, McCreedy and Heath 2004, RHJV 2004, RHJV 2007, Siegel et al. 2008).

Montane riparian and meadow habitats utilized by *brewsteri* willow flycatchers throughout the Sierra Nevada have been affected by grazing, clearing and burning for agricultural purposes, residential development, lowering of water tables, stream crossings, road construction, diverting of water which feeds riparian water courses, and flooding events caused by water releases from dams (Craig and Williams 1998, Siegel and DeSante 1999, Green et al. 2003, RHJV 2007, Siegel et al. 2008, Van Oort et al. 2015). Heavy grazing by sheep and other domestic ungulates in the late 1800s and early 1900s led to habitat changes that may persist today (Siegel et al. 2008). Parasitism by an increased population of Brown-headed Cowbirds (*Molothrus ater*) appears to have variable but potentially severe effects on willow flycatcher productivity (Sedgwick and Knopf 1988, Sedgwick and Iko 1999, Whitfield et al. 1999), Recent population declines of *brewsteri* observed in relatively pristine and seemingly unaffected habitats in Yosemite National Park suggest there are reasons for these declines outside of anthropogenic disturbance on the breeding grounds, including problems on the wintering grounds or migration routes (Siegel et al. 2008).

Habitat Requirements

Willow flycatchers breed in scrubby riparian areas and overwhelmingly prefer to nest in dense willow stands within the R5 National Forests (Grinnell and Miller 1944, Flett and Sanders 1987, Harris et al. 1987, Sedgwick 2000, Mathewson et al. 2010). Relative to other passerine species in California, willow flycatchers have a particularly short nesting season. They typically arrive on their breeding territories mid-May through mid-June and then initiate fall migration as early as August (Sanders and Flett 1989).

In the Sierra Nevada, *brewsteri* willow flycatchers primarily occupy wet meadows between 3,900-7,000 feet elevation characterized by brushy willow (*Salix*) thickets of 3-7 meters high with no overstory (Grinnell and Miller 1944, Flett and Sanders 1987, Harris et al. 1987, Sogge 1997, Sedgwick 2000, Mathewson et al. 2010). Less frequently they can breed in riparian corridors or habitats dominated by other species of riparian shrubs (Siegel et al. 2008). At all scales, the density of riparian shrub cover is directly correlated to both abundance and nesting success of this species and in most meadows 20-30% shrub cover appears to be the minimum to support productive flycatchers (Bombay et al. 2003).

On their wintering grounds, willow flycatchers are reported using a variety of habitats including both wet and dry lowland scrub, open grassy areas, and evergreen forest edges (Howell and Webb 1995, Lynn

et al. 2003). However, they are found to prefer scrubby riparian habitats similar to those typically occupied on their breeding grounds (Lynn et al. 2003). During migration, willow flycatchers use a variety of open habitats across North America and are not as dependent on the integrity of any specific habitat or location (Small 1994, Sedgwick 2000).

Analysis Area Surveys

There are 122 acres of potentially suitable habitat within the Mapes Crocker analysis area, including 61 acres of occupied habitat and 61 acres of emphasis habitat. Occupied Habitat is defined as a site where willow flycatcher(s) have been observed sometime during the breeding season since 1982 and meets the standard defined in the SNFPA FSEIS ROD (USDA 2004); emphasis habitat is defined as meadows larger than 15 acres that have standing water on June 1 and a deciduous shrub component.

Surveys for willow flycatcher in the analysis area were conducted in approximately 94% of suitable habitat within the Mapes Crocker project area between 2002 and 2021; all occupied habitat and 54 acres of emphasis habitat were surveyed. Project-specific surveys were conducted in the occupied habitat in 2021, but did not detect any WIFL.

Environmental Consequences – Willow Flycatcher

Alternative A – Proposed Action

Vegetation Treatments

Mechanical Thinning, Mechanical Fuels Treatments, Hand Thinning

Treatments overlap with 5 acres of occupied habitat and 12 acres of emphasis habitat. Direct effects due to treatments in forested habitat are not anticipated because the species is not expected to occur in forested areas, as it is generally found in meadows and other open riparian habitats. Some disturbance to individuals may occur due to treatments occurring adjacent to habitat.

Aspen Stand Improvement, Meadow Improvement, Spring Improvement

Currently delineated wildlife habitat improvements (aspen, meadow, springs) do not overlap with occupied or emphasis habitat. However, additional areas for wildlife habitat improvement could be discovered during project implementation planning that could occur within suitable habitat. Willow (*Salix*) and other riparian species will not be targeted for removal or modification during project activities. Disturbance to individuals could occur if project activities occur within currently occupied sites. Overall, wildlife habitat treatments are anticipated to be beneficial to willow flycatchers by removing encroaching conifers from systems that potentially support willow flycatcher habitat. Encroaching conifers have the potential to dewater systems and convert them to drier conditions which lead to further conifer encroachment and reduction of riparian shrub species through competition for sunlight and water.

Prescribed Fire

Prescribed fire treatment could occur as follow-up to other thinning treatments. Prescribed burning in habitat suitable for willow flycatchers (meadows) generally takes place in fall when vegetation conditions are dry enough to carry fire, after willow flycatchers have left the breeding grounds and migrated for the winter. Due to the inherently moist conditions of suitable habitat, fire is expected to burn at a low and patchy intensity and have limited impact to willows and other riparian shrubs. Any willows or shrubs burned are expected to recover quickly. Follow-up burning in forested treatment units would have no effect of willow flycatcher.

Road Treatments

Road treatments would occur outside of suitable habitat for willow flycatcher, and therefore would have no effect to the species.

Cumulative Effects

The cumulative effects listed under General Environmental Consequences (see above) are expected to continue. The true extent and effect of these activities on willow flycatchers is not known. Additionally, montane riparian habitats of breeding willow flycatchers could also be impacted by global climate change (Sedgwick 2000, Cain et al. 2003, Hayhoe et al. 2004, Siegel et al. 2008), in particular as related to the drying of montane meadows in the Sierra Nevada as droughts become more frequent (Gleick 2000, RHJV 2007, Siegel et al. 2008, Diffenbaugh 2015).

Alternative B – No Action

There would be no direct effects to willow flycatchers or their habitat, as no activities would occur that would cause disturbance to individuals or habitat. However, no action would result in further encroachment of conifers in meadows, potentially resulting in loss or degradation of suitable habitat. In the long-term, no action could have negative effects to willow flycatcher habitat.

Determinations – Willow Flycatcher

The proposed action (Alternative A) for the Mapes Crocker Project may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for the willow flycatcher. Wildlife habitat improvements are expected to have long-term benefits to willow flycatcher habitat.

The no action alternative (Alternative B) for the Mapes Crocker Project will not affect willow flycatchers.

Pallid Bat (*Antrozous pallidus*), Townsend's Big-eared Bat (*Corynorhinus townsendii*) and Fringed Myotis (*Myotis thysanodes*)

Existing Condition

Population Status

Three of the 17 bat species occurring on Plumas National Forest are designated as Forest Service sensitive species (*Antrozous pallidus, Corynorhinus townsendii, Myotis thysanodes*) and five are listed as species of special concern by the California Department of Fish and Wildlife (*A. pallidus, C. townsendii, Euderma maculatum, Lasiurus blossevillii, Eumops perotis californicus*;). Townsend's big-eared bat (*Corynorhinus townsendii*) populations have declined over the last 40-60 years in California (USDA 2001). Pallid bats (*Antrozous pallidus*) are of conservation concern because of sensitivity to disturbance, and abandonment of roosting sites (Arroyo-Cabrales and Grammont 2008). Fringed myotis (*Myotis thysanodes*) is distributed across California except the central valley and in deserts (Mayer and Laudenslayer 1988), and may be locally abundant or rare throughout western North America from British Columbia south to Mexico (Keinath 2004). Population dynamics are not understood, but limited data suggests serious population declines with many historically occupied sites abandoned because of disturbance and habitat modification (CBWG 2016).

Habitat Requirements

Forest structure is an important determinant of insectivorous bat assemblages (Blakey et al 2017), as bats have diverse morphological and call adaptations for a range of forests from cluttered to open in structure (Schnitzler et al 2003; Blakey et al 2017, 2019b). For example, a large-bodied bat with narrow (high aspect ratio) wings and a long duration, low frequency call is well adapted to forage on fast prey in open spaces, but has difficulty maneuvering and detecting prey in cluttered habitat (Denzinger and Schnitzel 2013). In contrast, clutter-adapted bats can differentiate prey from surrounding vegetation using high frequency, wide bandwidth calls and maneuver well in small spaces with low aspect ratio wings.

All three sensitive bat species occurring on PNF exhibit morphological and call adaptation for cluttered environments (*Myotis thysanodes*: O'Farrell and Studier 1980, Schnitzler et al 2003; *Antrozous pallidus*: Frick et al 2009; *Corynorhinus townsendii*: Fellers and Pierson 2002, Seguura-Trujillo et al 2016). These three species exhibit a continuum of roost site requirements. *C. townsendii* is colonial and roosts in caves, mines, and abandoned human structures, similarly *M. thysanodes* and *A. pallidus* roost in caves, crevices, and mines but these species also utilize live trees and snags for roosting. Clutter-adapted bats can differentiate prey from surrounding vegetation using high frequency, wide bandwidth calls and maneuver well in small spaces with low aspect ratio wings; however, some of these attributes (e.g., slow flight speed) may result in clutter-adapted bats being relatively more susceptible to predation in open habitats (Sleep and Brigham 2003).

Analysis Area Surveys

The bat analysis area is a subset of the Mapes Crocker Project analysis area, which excludes the Dixie Fire area. Acoustic surveys were conducted at 6 sites in the Mapes Crocker bat analysis area between 2016-2019, including one site surveyed during occupancy modeling efforts, which detected 11 of the 17 bat species found on the forest, including two of the three Forest Service Sensitive Species: *A. pallidus* and *M. thysanodes* (USDA Forest Service NRIS Wildlife, Natural Resource Manager, accessed February 2021).

Blakey et al (2019b) sampled bats acoustically at 83 randomly selected sites (n = 249 recording nights) across the Plumas National Forest over three summers (2015-2017), investigating relationships between fire regime, physiographic variables and forest structure and probability of bat occupancy for nine frequently detected species (17 bat species detected on the forest in total, Blakey et al. 2019b). Results indicated relationships between bat traits were underpinned by adaptations to diverse forest structure. Bats with traits adapting them to foraging in open habitats, including emitting longer duration and narrow bandwidth calls, were associated with higher severity and more frequent fires, whereas bats with traits consistent with clutter tolerance (structurally complex vegetation) were negatively associated with fire frequency and burn severity; relationships between edge-adapted bat species and fire were variable on the forest and may be influenced by prey preference or habitat configuration at a landscape scale (Blakey et al 2019b). All three Forest Service sensitive species (*A. pallidus and C. townsendii, M. thysanodes*) employ a clutter-adapted foraging strategy (i.e., utilizing structurally complex vegetation; Ibid). Clutter-adapted bats are predicted to occupy a high proportion of both the analysis area and treatment units (Table 7).

Two of three Forest Service sensitive species (*A. pallidus, C. townsendii*) were not sufficiently detected (detected < 10 % of nights) to allow modeling of occupancy and detection probabilities (Blakey et al 2019b). The rarity of these species poses challenges to understanding their life histories and ecology, let alone managing for specific resource needs. However, *M. thysanodes* (sensitive species) and *Myotis evotis* (clutter-adapted species) were detected with sufficient frequency to model species occupancy across the forest, and we used occupancy modeling results for these sympatric clutter-

adapted bats to infer project impacts to foraging habitat of other clutter tolerant bats (e.g., *A. pallidus* and *C. townsendii*). All nine species with sufficient detections (detected > 10 % of nights) to allow modeling of occupancy were predicted to occupy the analysis area and treatment units (Table 7). Predicted occupancy of bats with edge- and open-adapted foraging strategies were variable between the analysis area and treatment units; occupancy of clutter-adapted species was predicted to be relatively high at the landscape and treatment unit scale (Table 7). All species were predicted to occupy similar proportion (high, moderate, or low) of the treatment units as the bat analysis area.

The Dixie Fire area was excluded from occupancy analysis because the fire occurred after the model was developed for the PNF, therefore results of modeling would not be based on current conditions. Occupancy modeling was only applied to the analysis area and treatment unit areas outside of the Dixie Fire footprint.

Table 7. Proportion of the Mapes Crocker analysis and treatment areas predicted to be occupied by nine bat species based on occupancy models (Blakey et al. 2019b).

Species	Bat Analysis Area (5,432 acres)	Treatment Units (4,315 acres)	Foraging Strategy
Myotis evotis	100%	100%	Clutter
Lasionycteris noctivagans	100%	100%	Edge
Tadarida brasiliensis	92%	99%	Open
*Myotis thysanodes**	56%	72%	Clutter
Myotis lucifugus	49%	46%	Edge
Eptesicus fuscus	47%	47%	Edge
Lasiurus cinereus	44%	40%	Open
Myotis californicus	39%	39%	Edge
Myotis yumanensis	29%	23%	Edge

*USDA Region 5 Forest Service Sensitive Species

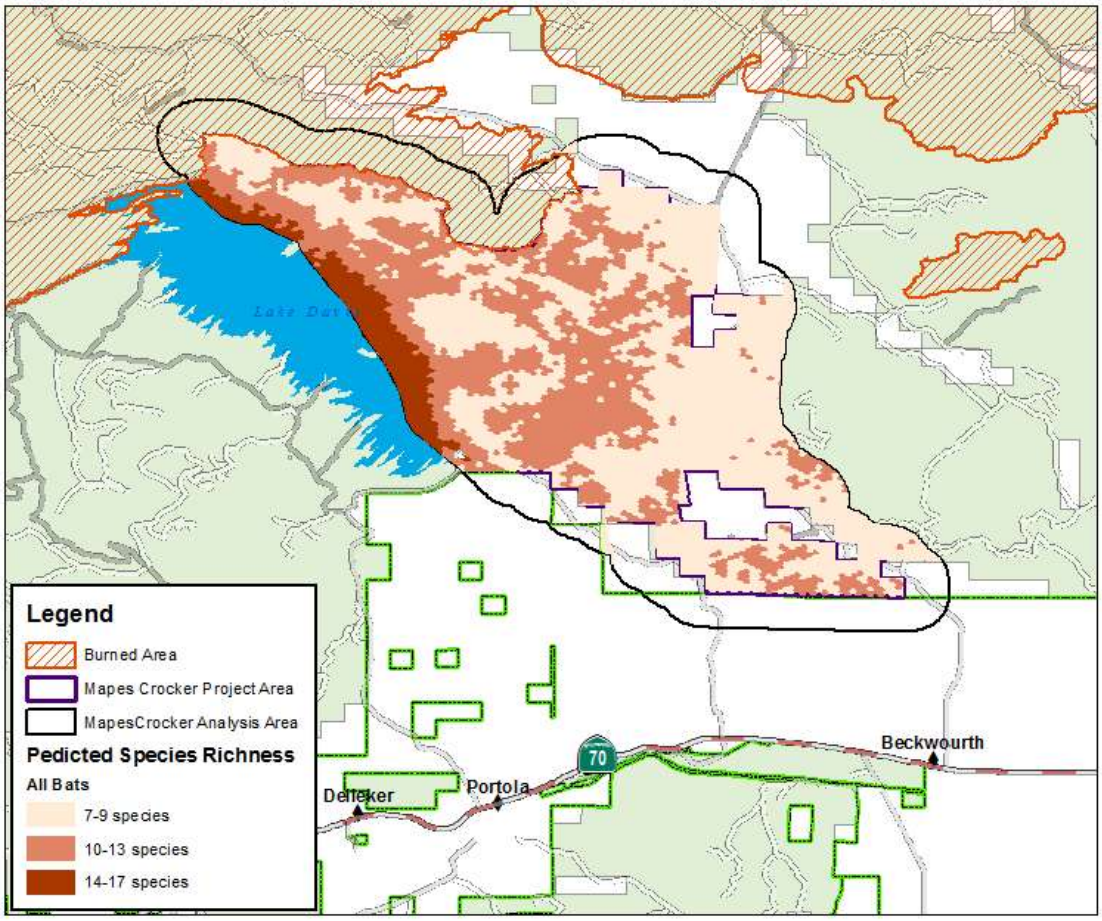

Figure 4. Mapes Crocker Project bat analysis area and predicted species richness for the entire bat community, based on multi-species occupancy model results (N=17 species; Blakey et al 2019b).

Environmental Consequences – Bats

Alternative A – Proposed Action

Proposed treatments would have negative impacts to sensitive bat species through reduction in complex forest vegetation structure, and project activities could disturb or cause abandonment of roost colonies if present. There are potential long-term benefits if proposed treatments should reduce the risk of future high severity wildfire passing through this landscape and potentially destroying all clutter-adapted sensitive habitat. A limited operating period would apply May 1- August 31 within 0.25 mile of maternity and other roosts.

Vegetation Treatments

Mechanical Thinning, Mechanical Fuels Treatments

Direct effects are possible through the destruction of active roosts through felling or removal of trees with hollows or loose bark, especially snags. The use of heavy equipment and chainsaws may cause noise and vibration disturbance significant enough to cause temporary or permanent abandonment of roost sites. These effects would be most severe during the breeding season (May 1 to August 15) when the potential exists for disturbance to active breeding females and maternity colonies. Proposed treatments would have negative impacts to sensitive bat species through reduction in complex forest

vegetation structure, but potential long-term benefits if proposed treatments should reduce the risk of future high severity wildfire passing through this landscape and potentially destroying all clutter-adapted sensitive habitat. Proposed treatments also may result in clutter-adapted bats being relatively more susceptible to predation as it is reasonable to expect more open habitat will be created by proposed treatments (Sleep and Brigham 2003, Blakey et al 2019b). Aside from changes in habitat availability for clutter-adapted (sensitive) bats, prey availability also may be impacted by treatments and indirectly affect sensitive species foraging efficiency; however, the direction and level of potential impacts is unknown.

Aspen Stand Improvement

The removal of larger trees greater than 30 inches DBH within or near the edges of aspen stands has the potential to negatively impact bats by removing roosting sites. However, aspen can also provide important roosting and foraging habitat for bats (Crapmton and Barclay 1998, Kalcounis and Brigham 1998, Parsons et al. 2003, Bartos 2007,) especially in mature aspen stands. While encroaching conifers can create bat roosting habitat by causing mature aspen to die off as it is over-topped and shaded out, aspen roost availability would decline over time as aspen stands are reduced in size and frequency on the landscape. Bats not only use sloughing bark of dead or dying aspen for roosting, but also cavities created in live trees by woodpeckers and fungi (Vonhof and Barclay 1996, Parsons et al 2003). Aspen stand improvements are expected to have short-term potential negative effects if suitable roost sites are removed, but long-term beneficial effects as enhancing aspen provides both foraging and roosting habitat.

Meadow Improvement

The removal of larger trees greater than 30 inches DBH within or near the edges of meadows has the potential to negatively impact roosting sites and some large snags may be felled as hazard trees during implementation near the edges of meadows. However, enhancing meadow habitat improves diversity for many wildlife species, including insects. Healthy meadows provide an important breeding ground for invertebrates, a key food source for the three sensitive bat species, and improves water retention. Additionally, prescribed fire regenerates forb and grassland communities which in turn provide forage for insects. While the three sensitive species are clutter-adapted foragers, healthy insect populations can extend into nearby forests and bats can travel long distances (>2 km) for foraging (Baker et al 2008). Therefore, improving meadow habitat in the wildlife analysis area would improve foraging habitat for these species.

Spring Improvement

Direct and indirect effects would be similar to those described for aspen stand improvement and meadow improvement treatments. Special aquatic features, such as springs, can provide foraging opportunity for bats and bats including at least two of the Sensitive species (*C. towensendii and M. thysanodes*) are known to be associated with spring habitat (Ports and Bradley 1996). Spring improvements are expected to have short-term potential negative effects if large trees suitable for roosting are removed, but long-term beneficial effects as spring habitat is improved.

Hand Thinning

Changes to foraging habitat via hand thinning are insignificant at the forest and species range scales. Disturbance associated with human presence and noise disturbance associated with chainsaw use would occur, potentially significant enough to cause temporary or permanent roost abandonment resulting in lowered reproductive success. These effects would be most severe during the breeding season (May 1 to August 15) when the potential exists for disturbance to active breeding females and maternity colonies.

Prescribed Fire

Managed fire may consume potential roost sites, but those same areas also would likely recruit potential roost sites through the prescribed burning process, so effects are expected to be negligible. The prey base for bats (insects) may have some site-specific short-term reductions post prescribed burning due to direct mortality of eggs, larvae, pupae and adults from fire. However, post-fire conditions have been shown, in many instances, to increase plant vigor (Lyon and Stickney 1976, DeByle 1984, Stein et al. 1992), and it has also been shown that many herbivorous insects preferentially feed on and have increased reproductive success and fitness on more vigorous plants and plant parts (Price 1991, Spiegel and Price 1996). Therefore, post fire conditions may increase the forage base available to bats.

Road Treatments

There would be no direct or indirect impacts to bats through watershed condition improvement projects. Watershed projects would not affect any important habitat elements of bats. Water quality improvements may lead to improvements in aquatic invertebrate populations, which would improve prey base when invertebrates are flying during their adult life stage.

Cumulative Effects

The existing condition reflects changes on the landscape from all activities that have occurred in the past, and analysis of cumulative effects of the proposed action evaluates the impact of the project on the existing condition within the analysis area. Cumulative effects to sensitive bat species could occur with the potential incremental loss of quantity and/or quality of habitat. Overall, increases in urbanization, increases in recreational use of NFS lands, and the utilization of natural resources on state, private and federal lands may contribute to habitat loss for these species.

White nose syndrome, a fungus that wakes hibernating bats resulting in high mortality rates, was recently recorded (June 2019) north of the Plumas National Forest near Chester, California. If white nose syndrome spreads in California, bat populations may experience sharp declines similar to the large die-offs reported on the eastern United States. Reducing disturbances to roosts and minimizing roost loss during harvest activities is an important consideration to prevent exacerbation of population declines and maintain healthy populations that can withstand additional stressors.

The fuelwood gathering and Christmas tree cutting programs on the PNF are ongoing programs that have been in existence for years and are expected to continue. Personal firewood cutting is a permitted ongoing activity in the analysis area along National Forest System Roads, and may negatively impact roost site availability and quality, given the majority of bat species on the Plumas National Forest use trees (alive and/or dead) for roosting. Road improvements associated with project activities may result in increased personal firewood collecting in the analysis area due to improved accessibility and snag visibility; however, data is not gathered on firewood collecting to permit such an evaluation. The risk of cumulative effects from the proposed activities will likely be negligible at this time based on the relatively small size of the project area in relation to habitat availability across the forest.

Alternative B – No Action

None of the proposed activities would occur. There would be no direct effects on bats or bat habitat, as no activities would occur that would cause disturbance to roosting or breeding bats, nor any impacts to the existing habitat conditions.

Indirect effects of no action include the potential for future wildfire and its impact on habitat development and recovery. Current conditions contributing to risk of high-severity fire would incrementally increase over time and potential wildfires in the area would continue to become more

difficult to suppress. High-severity fire could result in potential modification of suitable bat habitat including the loss of large trees, large snags and down woody material. However, Buchalski et al. (2013) found no evidence of negative effect of fire on foraging site selection and suggested that bats are resilient to landscape-scale fire and may even benefit from increased post-fire availability of prey and roosts.

Determinations for All Bats

The proposed action (Alternative A) for the Mapes Crocker Project may directly and indirectly impact individual sensitive bats (*Corynorhinus townsendii, Antrozous pallidus, Myotis thysanodes*) through implementation disturbance, reduced roost site availability and suitability, and will have short- and mid-term negative impacts (1-50 years post implementation) on sensitive bat foraging habitat; however, the project is not likely to result in a loss of viability in the analysis area, nor cause a trend toward federal listing.

This determination is based on the following:

1. Reducing forest stand density and improving overall health of the habitat and enhancing growth of the trees into the larger size classes is important for future bat roosts.
2. Wildlife habitat treatments could improve foraging opportunities.

The no action alternative (Alternative B) for the Mapes Crocker Project will not affect the three sensitive bat species discussed above.

Summary of All Determinations

The Proposed Action of the Mapes Crocker Project would protect, maintain or enhance key sensitive species habitat areas through project design, specifically: the use of variable density thinning would increase landscape heterogeneity and resilience, disturbance to sensitive species would be partially mitigated through implementation of limited operating periods (LOPs), and riparian areas and meadows would be managed by designating RCAs and meeting BMPs during implementation. Nevertheless, impacts to NFS lands resulting from the Mapes Crocker Project are expected to contribute to cumulative impacts on certain sensitive wildlife species. See Table 8 for a summary of the determinations.

The short-term effects of the proposed action are anticipated to be outweighed by the long term benefit of maintaining and enhancing habitat on the landscape by improving overall forest health and resiliency. Project activities will result in restoration of important wildlife habitat by improving aspen stands, meadows, and springs throughout the project area, reducing road density, and promoting the development of stands with larger diameter trees. Additionally, the use of prescribed fire would be beneficial to many wildlife species by promoting forage and prey species habitat.

Table 8. Determinations of Effects on Threatened, Endangered, Proposed, and Sensitive Animal Species that Potentially Occur on the Plumas National Forest

Species	Proposed Action	No Action
INVERTEBRATES		
Western Bumble Bee (*Bombus occidentalis)*	MAI	WNA
AMPHIBIANS		
Foothill yellow-legged frog (*Rana boylii*)	MAI	WNA
BIRDS		
Bald Eagle (*Haliaeetus leucocephalus*)	MAI	WNA

California spotted owl (*Strix occidentalis occidentalis*)	MAI	WNA
Greater sandhill crane (*Antigone canadensis tabida*)	MAI	WNA
Northern goshawk (*Accipiter gentilis*)	MAI	WNA
Willow flycatcher (*Empidonax trailii brewsteri*)	MAI	WNA
MAMMALS		
Pallid bat (*Antrozous pallidus*)	MAI	WNA
Townsend's big-eared bat (*Corynorhinus townsendii*)	MAI	WNA
Fringe-tailed Myotis	MAI	WNA

*__Determinations:__ **T, E & P Species: WNA** = Will Not Affect, **MAINLA** = May Affect but Is Not Likely to Adversely Affect Individuals or their designated critical habitat, **MAILAA** = May Affect and Is Likely to Adversely Affect Individuals or their designated critical habitat.
FS Sensitive Species: WNA = Will Not Affect, **MAI** = May Affect Individuals, but is not likely to result in a trend toward Federal listing or loss of viability, **MAILRTFL** = May Affect Individuals, and is Likely to Result in a Trend toward Federal Listing or loss of viability.

These project level effects determinations are consistent with the determinations reached in the SNFPA 2004 ROD by meeting the following three conditions:

1. The project is designed in accordance with all Forest Plan design criteria as analyzed in the SNFPA FSEIS 2004 ROD, Table 2
2. The spatial location and timing of this project, when considered cumulatively with all other projects affecting TES species and TES habitat, have been displayed and analyzed and results in a determination consistent with that reached in the SNFPA FSEIS 2004 ROD
3. Available new information that was not available in the SNFPA FSEIS 2004 ROD has been included in this project level analysis and this new information leads to the same conclusion as that within the SNFPA FSEIS 2004 ROD

Project-Specific Design Elements

- **Aquatic habitat:** Due to the presence of suitable SNYLF habitat, all hand thinning piles will be placed 25-82 feet from perennial and intermittent stream channels, lake and pond shores, and special aquatic features to avoid impacting the suitable habitat. No active ignitions for prescribed fire will occur within the 25-82-foot buffer.
- **Wildlife Trees:** These trees shall be >20" DBH or greater and provide structure beneficial for wildlife use. Suitable trees can be identified by certain desirable characteristics such as teakettle branches, large diameter broken tops, and large cavities located within the tree's bole.
- **Hardwoods:** Hardwoods will be favored for leave status and left standing. This includes species such as quaking aspen and cottonwood.
- **Large woody debris:** Large woody debris (LWD) shall be retained at 2004 SNFPA FSEIS ROD standards and guidelines levels, where available (10-15 tons/acre ≥12 inches diameter).
    - In areas considered deficient in large woody debris, cull logs would be left at the stump, where possible.
    - During grapple piling operations: Large woody debris should be left scattered across landscape.
- **Limited Operating Periods (LOPs):** project activities would have the appropriate LOP applied as identified in Table 10. If additional sensitive species of wildlife are discovered to occur within the project area during the life of the project, appropriate LOPs and protection measures would be applied.

- **Snags/Dead Trees:** Snags shall be retained at 2004 SNFPA FSEIS ROD standards and guidelines levels: 3- 6 snags, 15 inches and greater in diameter and 20 feet or more in height, should be left per acre.
- **Structural Thinning:** Structural thin areas that are at the higher basal area range (clumps) may contain snags and leaning trees to favor wildlife. Lower basal area ranges (gaps) may contain "wolf" and "broom" trees.
- **Wildlife habitation and nest trees:** Trees that show signs of current habitation, including nesting activity shall be left standing and not removed, regardless of size.

Table 9. Approximate number of down logs by average diameter at breast height (DBH) needed to meet 10-15 tons per acre on the Plumas National Forest (2004 Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement Record of Decision).

Average DBH (inches)	Number of down logs
12	24 to 30
14	18 to 24
16	14 to 20
18	10 to 14
20	8 to 12
22	6 to 8
24	4 to 6
26	4 to 6
28	4 to 6
30	4 to 6
> 30	2 to 4

Table 10. Wildlife Limited Operating Periods for species potentially occurring in the Mapes Crocker Project area. Operations would be limited during these periods over portions of the project area.

Species	Limited Operating Period
Yellow-legged frogs	April 15 - October 15 or dry soil conditions within 0.25 mile of site for in-stream work.
Bald Eagle	January 1 – August 31
Greater Sandhill Crane	April 1 – August 1 within meadows
Northern Goshawk	February 15 - Spetember 15
Peregrine falcon	February 1 - August 31
Willow Flycatcher	May 1 – July 31
Sensitive Bat Species	May 1 to August 15

Table 11. Project-specific design elements for sensitive wildlife species in the Mapes Crocker Project area.

Species	Activity	Design Element
Yellow-legged frogs (Sierra	All Activities	All suitable habitat within the project area will have at least one survey prior to commencement of operations.

<table>
<tr><td rowspan="6">Nevada and foothill)</td><td rowspan="2">Mechanical Operations</td><td>Suitable Habitat
Occupied or Unknown Occupancy</td><td>Suitable Habitat
Unoccupied*</td></tr>
<tr><td>No mechanical equipment within suitable habitat, including within 82 feet of intermittent or perennial streams. In-stream work such as culvert replacement would occur after surveys confirm there are no frogs within 0.25 mile of proposed activities, or dry soil conditions exist. In the event a Sierra Nevada yellow-legged frog is detected in the vicinity of in-stream work, the frog would be relocated to a safe place to prevent mortality after approval from USFWS. Stream crossings are subject to approval by the district biologist and district hydrologist, and no stream crossings allowed within 0.25 miles of occupied sites.</td><td>No mechanical equipment within 50 feet of special aquatic features. No mechanical equipment within 50 feet of intermittent or perennial streams for general forest treatments. No mechanical equipment within 25 feet of intermittent or perennial streams for wildlife habitat improvement treatments (aspen, meadows). Exceptions to these buffers are for project activities on existing roads and a limited number of stream crossings. Activities within suitable habitat are subject to approval by the district biologist and district hydrologist. Within areas of suitable habitat where heavy equipment use would occur, Sierra Nevada yellow-legged frog habitat occupancy will be assessed through surveys as defined in the Programmatic Biological Opinion, and will include at least one survey prior to but in the same calendar year implementation commences.</td></tr>
<tr><td rowspan="2">Prescribed Fire and Pile Burning</td><td>Suitable Habitat, Occupied or Unknown Occupancy</td><td>Suitable Habitat, Unoccupied*</td></tr>
<tr><td>No active ignitions or pile burning within suitable habitat, including within 82’ of aquatic habitat and wet meadow conditions.</td><td>Piles to be burned would be built outside of a 25-foot riparian buffer on intermittent and perennial streams. No active ignition within 25 feet of aquatic habitat and wet meadow conditions.</td></tr>
<tr><td rowspan="2">Fueling of gas-powered equipment, all sizes</td><td>Suitable Habitat, Occupied or Unknown Occupancy</td><td>Suitable Habitat, Unoccupied*</td></tr>
<tr><td>Will follow best management practices (BMPs) and standards and guidelines (S&Gs). Will not occur within 500 feet of sites occupied by R. sierrae.</td><td>Will follow best management practices (BMPs) and standards and guidelines (S&Gs).</td></tr>
<tr><td>Gray Wolves</td><td>All Activities</td><td colspan="2">A limited operating period (LOP) shall be instated around den sites. Exact locations, dates, and permissible activities will be determined in coordination with CDFW</td></tr>
<tr><td>Bald Eagle</td><td>All Activities</td><td colspan="2">A limited operating period (LOP) shall be instated from January 1- August 31 within active nest territories. Road maintenance activities and hauling of product would be permissible for routes through the area identified for wildlife protection during the LOP, unless otherwise recommended by the district biologist to mitigate site-specific concerns. Non-system roads and temporary road construction would be subject to the LOP.</td></tr>
<tr><td>Northern Goshawk</td><td>All Activities</td><td colspan="2">A limited operating period (LOP) shall be instated from February 15 - September 15 as described in SNFPA ROD 2004. If a recent nest site is unknown, surveys will be conducted prior to treatments within PACs.</td></tr>
<tr><td>Northern Goshawk</td><td>Aspen, Meadow, and Spring Improvements</td><td colspan="2">Wildlife habitat treatments within ¼ mile of a PAC would be evaluated by the silviculturist and biologist to develop a site-specific prescription for removal of trees >30” DBH.</td></tr>
<tr><td>Osprey</td><td>All Activities</td><td colspan="2">A limited operating period (LOP) shall be instated from March 15 – August 15 within 1/8 mile of a nest site. Road maintenance activities and hauling of product would be permissible for routes through the area identified for wildlife protection during the LOP, unless otherwise recommended by the district biologist to mitigate site-specific concerns. Non-system roads and temporary road construction would be subject to the LOP.</td></tr>
<tr><td>Greater Sandhill Crane</td><td>Meadow Improvements</td><td colspan="2">A limited operating period (LOP) restricting meadow improvement activities within the meadow interior (up to ½ mile of active nests if the meadow interior is larger) shall be instated from April 1 – August 1..</td></tr>
</table>

Willow Flycatcher	Aspen, Meadow, and Spring Improvements	A limited operating period (LOP) restricting work that has the potential to affect willow or riparian habitat within designated occupied habitat or unsurveyed emphasis habitat shall be instated from May 1 – July 31.
Sensitive Bat Species	All Activities	A limited operating period (LOP) shall be instated from May 1- August 15 within 1/4 mile of known maternity and other roosts. Road maintenance activities and hauling of product would be permissible for routes through the area identified for wildlife protection during the LOP, unless otherwise recommended by the district biologist to mitigate site-specific concerns. Non-system roads and temporary road constriction would be subject to the LOP.
All	Aspen and Meadow Improvements	Exceptions to conifer removal would include circumstances such as retaining trees with signs of wildlife habitation or desirable wildlife habitat characteristics, as well as trees displaying legacy characteristics. Legacy and wildlife habitat trees would be designated for retention by the district silviculturist, district biologist, or their personnel.

Compliance with the Forest Plan and Other Direction

Areas of suitable habitat have been surveyed to protocols based on the best available science, to determine information relevant to implementation of site-specific resource management activities. This BE has documented the species surveys that were conducted for this project, as well as the protocols that were implemented.

Where appropriate, limited operating periods (LOPs) would be applied to unsurveyed habitat considered to be suitable for threatened, endangered, or sensitive species; and to habitat considered suitable for any species for which viability may be a concern. See pages A-54, A-60 – A-62 (SNFPA FSEIS 2004 ROD). This BE documents the need for LOPs as appropriate and needed. If target species are found, LOPs would be implemented on a site-specific basis. As surveys are conducted and no target species are found, LOPs can be lifted.

Habitat connectivity, including hydrologic connectivity, would be maintained to allow movement of old forest or aquatic/riparian-dependent species between areas of suitable habitat. The analysis considered habitat connectivity as required by the 2004 SNFPA ROD. The project would maintain habitat connectivity for aquatic/riparian-dependent species as discussed above.

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Appendix A

Forestwide Standards and Guidelines

The following list of standards and guidelines are a subset of applicable direction from the Plumas National Forest Land and Resource Management Plan (USDA 1988) and the Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement Record of Decision (USDA 2004).

Standards and Guidelines #11 – Determine retention down woody material retention levels on an individual project basis, based on desired conditions. Emphasize retention of wood in the largest size classes and in decay classes 1, 2, and 3. Consider the effects of follow-up prescribed fire in achieving desired down woody material retention levels.

Determine snag retention levels on an individual project basis. Design projects to sustain across a landscape a generally continuous supply of snags and live decadent trees suitable for cavity nesting wildlife. Retain some mid and large diameter live trees that are currently in decline, have substantial wood defect, or have desirable characteristics (teakettle branches, large diameter broken top, large cavities in the bole) to serve as future replacement snags and to provide nesting structure. When determining snag retention levels, consider land allocation, desired condition, landscape position, and site conditions, avoiding uniform distribution across large areas. During project-level planning, consider the following guidelines for large snag retention:

- In westside mixed conifer, white fir, and ponderosa pine types, four of the largest snags per acre.
- In red fir, six of the largest snags per acre.
- Use snags larger than 15 inches diameter at breast height (DBH) to meet this guideline. Snags should be clumped and distributed irregularly across the treatment units. While some snags will be lost due to hazard removal or use of prescribed fire, consider these potential losses during project planning to achieve desired snag retention levels.

Standard and Guideline #27 – Minimize old forest habitat fragmentation. Assess potential impacts of fragmentation on old forest associated species (particularly fisher and marten) in biological evaluations.

Standard and Guideline #28 – Assess the potential impact of projects on the connectivity of habitat for old forest associated species.

Standard and Guideline #29 – Consider retaining forested linkages (with canopy cover greater than 40%) that are interconnected via riparian areas and ridge top saddles during project-level analysis.

Standard and Guideline #32 – Detection of a wolverine or Sierra Nevada red fox will be validated by a forest carnivore specialist. When verified sightings occur, conduct an analysis to determine if activities within 5 miles of the detection have a potential to affect the species. If necessary, apply a limited operating period from January 1 to June 30 to avoid adverse impacts to potential breeding. Evaluate activities for a 2-year period for detections not associated with a den site.

Standard and Guideline #33 – Conduct surveys in compliance with the Pacific Southwest Region's survey protocols during the planning process when proposed vegetation treatments are likely to reduce habitat quality in suitable California spotted owl habitat with unknown occupancy. Designate California spotted owl protected activity centers (PACs) where appropriate based on survey results.

Standard and Guideline #34 – Conduct surveys in compliance with the Pacific Southwest Region's survey protocols during the planning process when vegetation treatments are likely to reduce habitat quality are proposed in suitable northern goshawk nesting habitat that is not within an existing California spotted owl or northern goshawk PAC. Suitable northern goshawk nesting habitat is defined based on the survey protocol.

Standard and Guideline #60 – For historically occupied willow flycatcher sites, assess willow flycatcher habitat suitability within the meadow. If habitat is degraded, develop restoration objectives and take appropriate actions to move the meadow toward desired conditions.

Standard and Guideline #75 – For California spotted owl PACs: Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately ¼ mile of the activity center during the breeding season (March 1 through August 31), unless surveys confirm that California spotted owls are not nesting. Prior to implementing activities within or adjacent to a California spotted owl PAC and the location of the nest site or activity center is uncertain, conduct surveys to establish or confirm the location of the nest or activity center.

Standard and Guideline #76 – For northern goshawk PACs: Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately ¼ mile of the nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the nest stand within a protected activity center (PAC) is unknown, either apply the LOP to a ¼- mile area surrounding the PAC, or survey to determine the nest stand location.

Standard and Guideline #88 – Protect marten den site buffers from disturbance from vegetation treatments with a limited operating period (LOP) from May 1 through July 31 as long as habitat remains suitable or until another Regionally-approved management strategy is implemented. The LOP may be waived for individual projects of limited scope and duration, when a biological evaluation documents that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location.

Standard and Guideline #92 – Evaluate new proposed management activities within Critical Aquatic Refuges (CARs) and Riparian Conservation Areas (RCAs) during environmental analysis to determine consistency with the riparian conservation objectives (RCOs) at the project level and the Aquatic Management Strategy (AMS) goals for the landscape. Ensure that appropriate mitigation measures are enacted to 1) minimize the risk of activity-related sediment entering aquatic systems and 2) minimize impacts to habitat for aquatic- or riparian-dependent plant and animal species.

Standard and Guideline #101 – Ensure that culverts or other stream crossing do not create barriers to upstream or downstream passage for aquatic-dependent species. Locate water drafting sites to avoid adverse effects to in-stream flows and depletion of pool habitat. Where possible, maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows, wetlands, and other special aquatic features.

Standard and Guideline #105 – At either the landscape or project-scale, determine if the age class, structural diversity, composition, and cover of riparian vegetation are within the range of natural variability for the vegetative community. If conditions are outside the range of natural variability, consider implementing mitigation and/or restoration actions that will result in an upward trend. Actions could include restoration of aspen or other riparian vegetation where conifer encroachment is identified as a problem.

Standard and Guideline #110 – Use screening devices for water drafting pumps. (Fire suppression activities are exempt during initial attack.) Use pumps with low entry velocity to minimize removal of aquatic species, including juvenile fish, amphibian egg masses, and tadpoles, from aquatic habitats.

Appendix B

California Wildlife Habitat Relationship (CWHR) Definitions

Table B-1. California Wildlife Habitat Relationship (CWHR) strata definitions

Tree Size		Canopy Closure	
Size Class	**Diameter at Breast Height (inches)**	**Closure Class**	**Percent Ground Cover**
1	<1	S	10-24%
2	1-6	P	25-39%
3	6-11	M	40-59%
4	11-24	D	60-100%
5	>24		
6	Size class 5 trees over a distinct layer of size class 4 or 3 trees, canopy exceeds 60%		

Table B-2. California Wildlife Habitat Relationship (CWHR) vegetation codes and their definitions

Habitat	Definition	Habitat	Definition
AGS	Annual Grassland	MHW	Montane Hardwood
BAR	Barren	MRI	Montane Riparian
DFR	Douglas Fir	PGS	Perennial Grassland
EPN	Eastside Pine	PPN	Ponderosa Pine
JPN	Jeffrey Pine	RFR	Red Fir
LAC	Lacustrine	SCN	Subalpine Conifer
LPN	Lodgepole Pine	SMC	Sierra Mixed Conifer
MCP	Montane Chaparral	WFR	White Fir
MHC	Montane Hardwood-Conifer	WTM	Wet Meadow

Appendix C

Table C-1. Ongoing and reasonably foreseeable projects within the Mapes Crocker Project area.

Name	Year	Location	Treatment Type	Comments
Dixie Fire Deck Sale	2021/2022	Crocker Cut-Off Rd; 24N06	Sale of green trees cut and decked during Dixie Fire Suppression	
Fuelwood Gathering	Ongoing	Forest-wide	There were 82 commercial woodcutting permits for 608 cords of wood and 616 personal woodcutting permits for 1,882 cords of wood issued on the Beckwourth Ranger District In 2019.	Cord wood consists of dead trees and down logs within the forest, along forest roads, and within cull decks created by past logging operations, or as standing snags. Future annual quantities are estimated to be similar to those of 2019.
Christmas Tree Cutting Program	Annually, November - December	Forest-wide	There were 2,363 permits issued on the Beckwourth Ranger Distict in 2019. Due to the COVID-19 pandemic the Plumas National forest offered online Christmas Tree cutting permits for the first time in 2020. As of December 7, 2020 approximately 10,200 permits were issued forest-wide.	This consists of the trees ≤ 6 inches in diameter (measured at the ground) permitted for removal. Future sales are expected to be similar to 2019 and 2020.
Recreation	Ongoing	Forest-wide		Camping, bicycling, hunting, fishing, hiking, mining and OHV use. OIP Concessionaire operation at Crocker Guard Station and Crocker CG.
Grazing Allotments	Annually	Throughout project area	Cattle and sheep grazing.	There are two active allotments in the Mapes Crocker project boundary.
Lost and Found Bike Race	Annually	Throughout project area		Annual Gravel Grinder event put on by Sierra Buttes Trail Stewardship- one day, typically in early June